AC 61-70A

# FLIGHT INSTRUCTOR
## Instrument-Airplane
## WRITTEN TEST GUIDE

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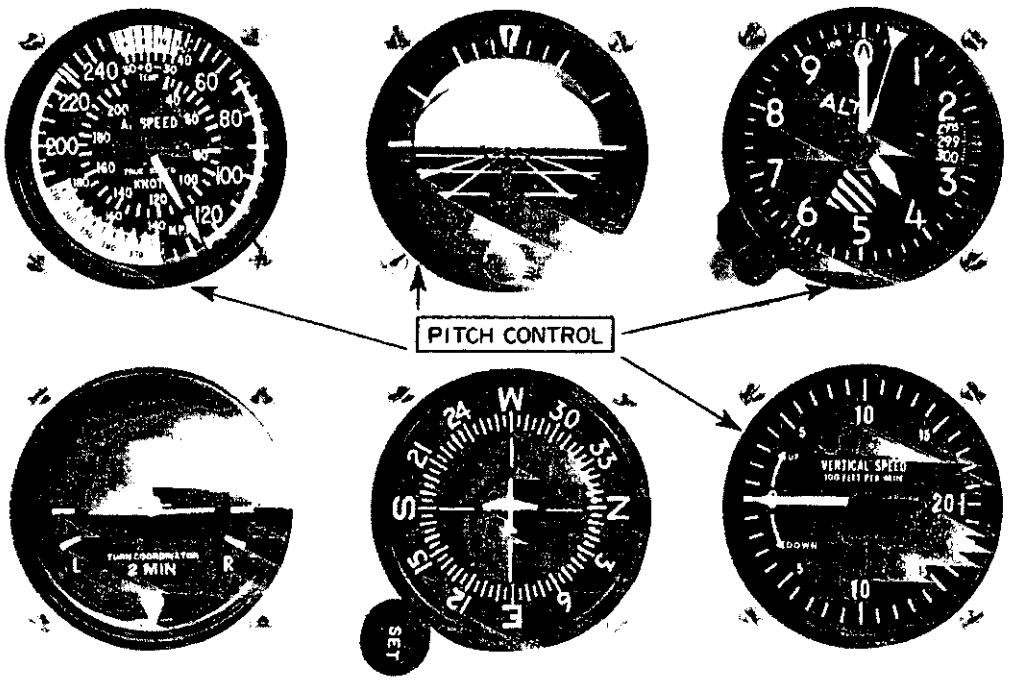


Revised 1980

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

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# INSTRUMENT–AIRPLANE
# WRITTEN TEST GUIDE


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**U.S. DEPARTMENT OF TRANSPORTATION**
**FEDERAL AVIATION ADMINISTRATION**

OFFICE OF FLIGHT OPERATIONS

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Washington, D.C. 20402 -

# PREFACE

The Federal Aviation Administration has developed this guide to help applicants prepare for the Flight Instructor Instrument-Airplane Written Test. It supersedes AC 61-70, Flight Instructor Instrument-Airplane Written Test Guide, dated 1974.

This guide outlines the aeronautical knowledge requirements for an instrument instructor, informs the applicant of source material that can be used to acquire this knowledge, and includes the test items and illustrations representative of those used in the FAA Flight Instructor Instrument-Airplane Written Test.

The test items in this guide are based on regulations, principles, and practices that were current at the time this publication was printed. This guide will be periodically revised.

Test items in the FAA written tests are updated as soon as possible when the need arises, consequently, FAA written test items may vary from those contained herein.

The FAA does not supply the correct answers to questions included in this guide. Students should determine the answers by research and study, by working with instructors, or by attending ground schools. The FAA is in no way responsible for the contents of commercial reprints of this publication nor the accuracy of answers they may list.

Comments regarding this publication should be directed to the U.S. Department of Transportation, Federal Aviation Administration, Flight Standards National Field Office, AFO-590, P.O. Box 25082, Oklahoma City, Oklahoma 73125.

# CONTENTS

# FLIGHT INSTRUCTOR INSTRUMENT-AIRPLANE WRITTEN TEST GUIDE

## INTRODUCTION TO FLIGHT INSTRUCTION

Although some people possess to a greater degree than others the desirable traits of a good instructor, the ability to instruct effectively comes only through study, experience, and hard work. Probably more than any other single factor, the flight instructor's own attitude toward flight instruction determines how well the teaching task is accomplished.

After the prospective flight instructor has acquired the FAA Flight Instructor Certificate, it is imperative that a continuous effort be made to stay abreast of the latest trends in aviation products, regulations, and practices. This is extremely important for the flight instructor because aviation is not static; it is dynamic and changing, and what holds true today may not necessarily apply tomorrow. The flight instructor must keep informed about new techniques, new equipment, new procedures, and regulatory changes.

Knowledge and understanding are seldom gained quickly or easily. There can be no substitute for diligent study to attain basic knowledge, unremitting effort to develop competence, and continuous review to remain current in the many areas where technological change is the rule rather than the exception. This is particularly true in the diversified field of instrument flight instruction.

The purpose of this guide is to provide guidance to the applicant by outlining the scope of knowledge required. By using this guide the applicant is better able to intelligently follow an effective study plan. Because both the FAA written test guides and FAA written tests are developed by the same personnel, there is a direct relationship between the two. This guide, then, directs the applicant to the subject matter included in the tests.

## CERTIFICATION REQUIREMENTS

To be eligible for a Flight Instructor Certificate with an Instrument-Airplane rating, the initial certification process requires that the applicant pass a Flight Instructor Instrument-Airplane Written Test and a Fundamentals of Instructing Written Test. However, if the applicant already holds a valid FAA Flight Instructor Certificate or a Ground Instructor Certificate which was acquired after passing a written test on Fundamentals of Flight Instruction, the applicant is not required to take the separate test on Fundamentals of Instructing when applying for an additional instructor rating.

It is not necessary to take the Fundamentals of Instructing Written Test on the same day as the Flight Instructor Instrument-Airplane Written Test and it is immaterial which test is taken first. The certification process also requires the applicant to pass a practical test and demonstrate competency to instruct students during instrument flight.

For specific information pertaining to flight instructor certification, review the applicable sections of Federal Aviation Regulations, Part 61.

## WRITTEN TEST

The Flight Instructor Instrument-Airplane Written Test is very comprehensive because, to be effective, it must test an applicant's knowledge in many subject areas. These areas include all subjects in which ground instruction is required for an airplane pilot instrument rating. In addition, the applicant must be knowledgeable in the areas of Fundamentals of Instructing and classroom instructing techniques. These subject areas are incorporated in the appropriate written tests.

The Flight Instructor Instrument-Airplane Written Tests contain 100 test items and 5 hours are allowed for taking this test.

All test items are the objective, multiple choice type, and each can be answered by the selection of a single response. This type of test conserves your time when taking the test, permits greater coverage of subject matter, and lessens the time required for scoring.

Each item is independent of other test items. That is, a correct response to one test item does not depend upon or influence the correct response to another test item.

After the test is completed, your answer sheet is forwarded to the U.S. Department of Transportation, Federal Aviation Administration, Aeronautical Center in Oklahoma City, for scoring by ADP computers. Shortly thereafter, you will receive an Airman Written Test Report which not only includes the score but lists, in code, the subject areas in which difficulty was experienced. Those subject areas can be determined by reference to

the Subject Matter Outline which accompanies the report. This method provides an essential feedback to you and can be effectively used in weak areas.

## TAKING THE TEST

Communication between individuals through the use of words is a complicated process. Since certification tests involve the use of written rather than spoken words, communication between the test writers and the persons being tested may become a difficult matter if care is not exercised by both parties. Consequently, considerable effort is expended to write each test item in a clear, precise manner. Applicants should carefully read the information and instructions given with the tests, as well as the statements in each test item.

At the testing center, the applicant taking the Flight Instructor Instrument-Airplane Test will be supplied a question book containing several hundred questions, a 100-item question selection sheet which indicates the specific questions to be answered, and an Airman Written Test Application (AC Form 8080-3) which contains the answer sheet.

To familiarize you with the procedures for taking the official FAA written test, samples of the General Instructions, Written Test Application, Question Selection Sheet, and answer sheet are provided in this guide.

Also included in this guide are questions which are representative of those in the official Flight Instructor Instrument (FII) Question Book.

Always remember the following when taking the test:

1. Enter personal data in appropriate spaces on the test answer sheet in a complete and legible manner to aid in scoring. The test number is the number printed on the Question Selection Sheet, not the number printed on the question book.

2. Answer only the 100 questions whose numbers appear on your question selection sheet.

3. There are no "trick" questions. Each statement means exactly what it says. Do not look for hidden meanings. The statement does not concern exceptions to the rule; it refers to the general rule.

4. Carefully read the entire test item, statement, or question before selecting an answer. Skimming and hasty assumptions can lead to a completely erroneous interpretation of the problem because of failure to consider vital words. Examine and analyze the list of answers or phrases, then select the one that answers the question or completes the statement correctly.

5. Only one of the listed answers given is completely correct. The others may be the result of common misconceptions, or insufficient knowledge of the subject. Consequently, many of the incorrect answers may appear to be plausible to those persons whose knowledge is deficient. If the subject matter is adequately understood, the questions should not be difficult to answer correctly.

6. If considerable difficulty is experienced with a particular test item, do not spend too much time on it, but continue with other items which you consider to be less difficult. When all of the easier items are completed, go back and complete those items that were found to be more difficult. This procedure will enable you to use the available time to maximum advantage.

It must be emphasized here that the total number of subject codes shown on the test report is not necessarily an indication of the total number of test items answered incorrectly. When one or more questions are missed in a given subject area, the code for that subject appears only once on the grade report.

After the prescribed written tests have been passed, the certification process requires the flight instructor applicants to pass a practical test in which competency to instruct students during flight must be demonstrated. This practical test must be satisfactorily completed within 24 months after the date the written tests were passed.

The written tests are administered by all FAA General Aviation District Offices (GADO), Flight Standards District Offices (FSDO), and some Air Carrier District Offices (ACDO). In addition, certain designated individuals, some associated with privately owned organizations, have been given the authority to administer the FAA written tests.

## RETESTING AFTER FAILURE

An applicant who fails the written test may not apply for retesting until 30 days after

the date the test was failed. In the case of the first failure, however, a person may apply for retesting before the 30 days have expired upon presenting a written statement from an authorized instructor certifying that appropriate ground instruction was given to the applicant and the instructor finds that person competent to pass the test. In addition, the written test report of the previously failed test must be presented at the time of retesting.

# RECOMMENDED STUDY MATERIALS

INTRODUCTION

Professionalism in flight instruction is as important as it is in any profession. To enhance professionalism in the field of flight instruction, the prospective flight instructor should establish and maintain a library with current aviation references. By obtaining appropriate study materials when preparing for certification, the prospective flight instructor will have a beginning of an aeronautical library which will be beneficial for career use. The following lists essential reference materials but does not include all the useful material that is available. Other excellent textbooks, audiovisual training aids, and instructional materials produced commercially may be obtained from various bookstores and fixed-base operators engaged in flight training.

ADVISORY CIRCULARS

FAA Advisory Circulars inform the aviation public in a systematic way of nonregulatory material of interest. Each circular issued is listed numerically within its subject-number breakdown which corresponds to the subject area of the Federal Aviation Regulations. A brief explanation of the contents is given for each listing in AC 00-2, Advisory Circular Checklist.

The checklist AC 00-2, available free of charge, lists advisory circulars that are for sale as well as those distributed free of charge by the Federal Aviation Administration. The checklist also gives the addresses and phone numbers of the Superintendent of Documents bookstores throughout the United States.

When a price is listed after the description of a circular in the checklist, that circular is for sale by the Superintendent of Documents (Sup't. Doc's.). When (Sub.) is included with the price, the advisory circular is available on a subscription basis only. After your subscription has been entered by the Superintendent of Documents, supplements or changes to the basic document will be provided automatically at no additional charge until the subscription expires. When no price is given, the circular is distributed free of charge by FAA.

Request free advisory circulars from:

U.S. Department of Transportation
Publications Section, M-443.1
Washington, D.C. 20590

Persons who want to be placed on FAA's mailing list for future circulars should write to:

U.S. Department of Transportation
Distribution Requirements Section, M 482.2
Washington, D.C. 20590

It is recommended that the Flight Instructor Instrument applicant obtain Advisory Circulars in at least the following subjects:

Subject Number and Subject Matter

00 . . . . . General
20 . . . . . Aircraft
60 . . . . . Airmen
70 . . . . . Airspace
90 . . Air Traffic Control and General Operating Rules
170 . . . . . Air Navigation Facilities

Flight Training Handbook, AC 61-21A. (Sup't. Doc's. SN 050-007-00504-1.) Provides information and direction in the introduction and performance of training maneuvers for student pilots, pilots who are requalifying or preparing for additional ratings, and for flight instructors.

Pilot's Handbook of Aeronautical Knowledge, AC 61-23A. (Sup't. Doc's. SN 050-011-00051-8.) Contains essential, authoritative information used in training and guiding private pilots, and covers most subject areas in which an applicant may be tested. Tells how to use the Airman's Information Manual, the data in FAA-approved airplane flight manuals, and the basic instruments.

Aviation Weather, AC 00-6A. (Sup't. Doc's. SN 050-007-00283-1.) Contains information on weather phenomena for pilots and other flight operations personnel whose interest in meteorology is primarily in its application to flying.

Aviation Weather Services, AC 00-45B. (Sup't. Doc's. SN 050-007-00513-0. ) Supplements Aviation Weather, AC 00-6A, in that it explains the weather service in general and the use and interpretation of reports, forecasts, weather maps, and prognostic charts in detail. Is an excellent source of study for pilot certification examinations.

Instrument Flying Handbook, AC 61-27B. (Sup't. Doc's. SN 050-007-00067-7.) Provides basic information for acquiring the knowledge necessary to fly by reference to instruments and to operate in the National Airspace System.

Aviation Instructor's Handbook, AC 60-14. (Supt. Docs. SN 050-011-00072-1.) Is designed to provide currently certificated flight and ground instructors and applicants for such certificates, with comprehensive, accurate, and easily understood information on learning and teaching, and to relate this information to the aviation instructor's task of conveying aeronautical knowledge and skill to students.

Wake Turbulence, AC 90-23D. Presents information on the subject of wake turbulence and suggests techniques that may help pilots avoid the hazards associated with wingtip vortex turbulence. It is free upon request.

Instrument Rating Written Test Guide, AC 61-8D. (Supt. Docs. SN 050-007-00410-9.) Provides guidance for pilots who are preparing for the Instrument Pilot Rating.

Civil Use of U.S. Government Produced Instrument Approach Charts, AC 90-1A. (Free FAA). Describes and clarifies the Instrument Approach Charts.

Flight Test Guide--Instrument Pilot (Airplane), AC 61-56A. (Supt. Docs. SN 050-007-00343-9.) A publication designed to assist the instrument pilot applicant in preparing for the Instrument Rating Flight Test. The instrument flight instructor should find this guide helpful in preparing students for the Instrument Rating Flight Test.

FEDERAL AVIATION REGULATIONS (FARs)

The FAA publishes the Federal Aviation Regulations to make readily available to the aviation community the regulatory requirements placed upon them. These regulations are sold as individual Parts by the Superintendent of Documents.

The more frequently amended Parts are sold on subscription service (that is, subscribers will receive Changes automatically as issued), while the less active Parts are sold on a single-sale basis. Changes to single-sale Parts will be sold separately as issued. Information concerning these Changes will be furnished by FAA through its "AC 00-44, Status of the Federal Aviation Regulations." Instructions for ordering this free status list are given in the front of each single-sale Part.

Check or money order made payable to the Superintendent of Documents should be included with each order. Submit orders for single-sales and subscription Parts on different order forms. No COD orders are accepted. All FAR Parts should be ordered from:

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

How To Obtain Publications Sold by Superintendent of Documents.

1. Use an order form (not a letter unless absolutely necessary) when ordering Government publications. Order forms may be duplicated or obtained free upon request from:

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U.S. Government Printing Office
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2. Send separate orders for subscription and nonsubscription items.
3. Give the exact name, Advisory Circular identification number, and stock number when ordering publications.
4. Send a check or money order for the exact amount made out to the Superintendent of Documents; DO NOT SEND CURRENCY. (Include an additional 25% to cover postage for foreign handling.)
5. If a letter is used to request publications, enclose a self-addressed mailing label.
6. All prices are subject to change. The latest Advisory Circular Checklist, AC 00-2, should be consulted for current pricing of publications. It is important that the correct amount be enclosed with the order.

The suggested Parts for study are:

| FAR Part | Title |
|---|---|
| 1 | Definitions and Abbreviations. |
| 23 | Airworthiness Standards: Normal, Utility, and Acrobatic Category Airplanes. |
| 61 | Certification: Pilots and Flight Instructors. |
| 71 | Designation of Federal Airways, Area Low Routes, Controlled Airspace, and Reporting Points. |
| 91 | General Operating and Flight Rules. |
| 95 | IFR Altitudes. |
| 97 | Standard Instrument Approach Procedures. |

MISCELLANEOUS PUBLICATIONS

1. Radio Navigation Charts (for sale by National Ocean Survey).

a. En Route Low Altitude Charts and En Route High Altitude Charts. These charts provide the necessary aeronautical information for en route instrument navigation.
b. Instrument Approach Procedure Charts (available for ADF, VOR, and ILS approach). These charts portray the aeronautical data which is required to execute instrument approaches to airports.
c. Low Altitude Area Charts. These charts supplement the instrument en route charts by giving departure, arrival, and holding procedures at principal airports.
d. Standard Terminal Arrival Routes (STARs). This publication consists of standard terminal arrival routes and is designed for use with en route high, low, and area charts.
e. Standard Instrument Departures (SIDs). This publication consists of standard instrument departures from civil aerodromes and is designed for use with en route high, low, and area charts.

The National Ocean Survey publishes and distributes aeronautical charts of the United States. A "Catalog of Aeronautical Charts and Related Publications," which lists prices and information regarding distribution service may be obtained free upon request from:

Distribution Division (C44)
National Ocean Survey
Riverdale, Maryland 20840

2. VFR/IFR Pilot Exam-O-Grams. Provide brief explanations of important aeronautical subjects. These include concepts and procedures critical to aviation safety, common misconceptions among pilot applicants, and areas which cause general difficulty in written tests. Exam-O-Grams are free and may be obtained by contacting U.S. Department of Transportation, Federal Aviation Administration, Flight Standards National Field Office, AFO-590, P.O. Box 25082, Oklahoma City, Oklahoma 73125.

3. Airplane Flight Manuals and Pilot's Operating Handbooks. Aircraft manufacturers issue manuals for each aircraft model. They may be obtained from aircraft manufacturing companies or possibly from local airplane dealers and distributors.

4. National Transportation Safety Board Part 830. This publication deals with procedures required in the notification and reporting of accidents and lost or overdue aircraft within the United States, its territories, and possessions. It is free upon request from the National Transportation Safety Board, Publications Branch, Washington, D.C. 20594.

FLIGHT INFORMATION/OPERATIONAL PUBLICATIONS

Airman's Information Manual: Basic Flight Information and ATC Procedures. This manual is designed to provide airmen with basic flight information and ATC procedures for use in the National Airspace System (NAS) of the U.S. It also contains items of interest to pilots concerning health and medical facts, factors affecting flight safety, a pilot/controller glossary of terms used in the Air Traffic Control System, and information on safety, accident, and hazard reporting. (Sup't. Doc's.)

Graphic Notices and Supplemental Data. A publication containing a tabulation of Parachute Jump Areas; Special Notice Area Graphics; Terminal Area Graphics; Terminal Radar Service Area (TRSA) Graphics; and other data, as required, not subject to frequent change. This publication is issued quarterly. (Sup't. Doc's.)

Notices to Airmen. A publication containing current Notices to Airmen (NOTAMs) which are considered essential to the safety of flight as well as supplemental data affecting the other operational publications listed here. This publication is issued every 14 days. (Sup't. Doc's.)

Airport/Facility Directory. Published in seven volumes covering specific geographic areas of the conterminous U.S., these publications contain information on airports, communications, navigational aids, instrument landing systems, VOR receiver checkpoints, FSS/Weather Service telephone numbers, and various other pertinent special notices. These publications are available in single copy or subscription service from the National Ocean Survey and their descriptions and ordering instructions are contained in the NOS catalog described previously.

# STUDY OUTLINE

The study outline which follows is the framework for basic aeronautical knowledge that the prospective instrument instructor should know. Each question on the FAA written test can be directly related to one or more of the topics contained in this outline. This subject matter is based on operationally realistic airman activity and encompasses the requirements specified in FAR 61.185.

I. AERONAUTICAL TERMS

Refer to Part 1 of the Federal Aviation Regulations, the Airman's Information Manual, or other FAA publications.

II. PHYSIOLOGICAL FACTORS RELATED TO INSTRUMENT FLIGHT

A. Adjustment to the Flight Environment.
   1. Ground habits vs. flight habits.
   2. Individual differences in pilots.
   3. Importance of physiological factors to the instrument pilot.

B. Reaction of the Body to Changes in Atmospheric Pressure.
   1. Changes in altitude.
   2. Aerotitis.
   3. Aerosinusitis.

C. Reaction of the Body to Changes in Oxygen Partial Pressure.
   1. Hypoxia -
      a. Causes of carbon monoxide poisoning.
      b. Effects of carbon monoxide poisoning.
      c. Prevention and treatment if carbon monoxide poisoning occurs.

D. Self Imposed Stress.
   1. Fatigue and its effect on the body during flight.
   2. Alcohol and its effect on the body during flight.
   3. Drugs and their effects on the body during flight.
   4. Scuba diving and its effect on the body during flight.
   5. Panic causes and prevention.

E. Sensations of Instrument Flight.
   1. Body sensory systems involved in equilibrium -
      a. Eyes.
      b. Inner ear.
      c. Skeletal muscles.
   2. Sensory illusions in flight-vertigo-spatial disorientation -
      a. Flight factors contributing to sensory illusions.
      b. Flight factors contributing to visual illusions.
      c. Combating sensory illusions.

F. Principles and Problems of Vision.
   1. Reactions to illumination levels and techniques of seeing.
   2. Instrument lighting.
   3. Use of lights in adverse weather.
   4. Lightning in thunderstorms.

G. Noise, Vibration, and Temperature.

H. Cabin Pressurization and Decompression.

I. Oxygen Equipment.
   1. Requirements.
   2. Types of oxygen.
   3. Storage of oxygen.
   4. Regulators and masks.

III. REGULATIONS AND ATC SYSTEMS AND PROCEDURES

A. Aircraft.
   1. Required aircraft certificates and documents.
   2. FCC station license.
   3. Equipment and checks -
      a. Required instruments and equipment for IFR flight.
      b. Required VOR checks.
      c. ADF checks.
      d. ATC transponder requirements.
      e. ATC transponder tests and inspections.
      f. Altimeter system tests and inspections.
      g. Automatic altitude reporting requirements.
      h. Communication checks.
      i. Portable electronic devices.
      j. Emergency locator transmitter.
      k. Supplemental oxygen.

B. Airman.
   1. Pilot certificates and ratings required for IFR flight.
   2. FCC radiotelephone operators permit.
   3. Duration of certificates.
   4. Instrument rating requirements.
   5. Recent flight experience.
   6. Pilot logbooks and logging instrument time.

7. Responsibility and authority of pilot in command.
8. Flight instructor records.
9. Flight instructor authorizations and limitations.
10. Renewal of flight instructor certificate.
11. Emergency action -
    a. Deviation from rules.
    b. Required reports.
12. Notification and reporting of aircraft accidents, incidents, and overdue aircraft.

C. Instrument Flight Rules.
1. Visual flight on VFR and IFR flight plans.
2. Information required on IFR flight plans and compliance with ATC clearances.
3. Standard takeoff and landing and alternate minimums, IFR.
4. Limitations on use of instrument approach procedures.
5. Minimum IFR altitudes.
6. IFR cruising altitudes/flight levels.
7. VFR on top operation.
8. Courses to be flown.
9. IFR, radio communications -
    a. Required reports.
    b. Other reports.
10. IFR, two-way radio communication failure.
11. Malfunction reports while IFR in controlled airspace.
12. Alternate airport requirements for IFR operations.
13. Fuel requirements for IFR operations.
14. Altimeter setting.
15. Aircraft speed.

D. Airspace and Airway Route System.
1. Controlled airspace -
    a. Control zones.
    b. Control areas.
    c. Continental control area.
    d. Positive control area.
    e. Transition areas.
    f. Jet advisory areas.
    g. Terminal control areas.
    h. Terminal radar service areas (TRSA).
2. Uncontrolled airspace -
    a. VFR and IFR requirements.
    b. Restricted areas and climb corridors.
    c. Warning areas.
    d. Military operational areas (MOAs).
    e. Alert areas.
3. National security airspace -
    a. ADIZ.
    b. Scatana.
4. Other airspace areas -
    a. Airport traffic areas.
    b. Airport advisory areas.
    c. Temporary flight restrictions.
5. Victor (VOR) airways -
    a. Limits:
        (1) Width.
        (2) Base.
        (3) Top.
    b. Radials and bearings.
    c. Route identification:
        (1) Airway.
        (2) Military route.
        (3) Substitute route.
        (4) Unusable route.
    d. Altitude limits:
        (1) MOCA.
        (2) MEA.
        (3) MRA.
        (4) MCA.
        (5) MAA.
    e. Segment limits:
        (1) Mileage breakdown.
        (2) Minimum altitude change.
        (3) VOR changeover points.
        (4) Altimeter setting boundary.
        (5) Time zone boundary.

E. Airport, Air Navigation Lighting, and Marking Aids.
1. Aeronautical beacons.
2. Airport rotating beacons.
3. Auxiliary lights.
4. Obstruction lights.
5. Daylight beacon operation.
6. Lighted traffic indicators.
7. Instrument approach light system.
8. Visual approach slope indicators (VASI).
9. Runway and identifier lights(REIL).
10. Airport runway marking.
11. In-runway lighting (centerline).

F. ATC Services Available to Pilots.
1. Automatic terminal information service (ATIS).
2. Ground control.
3. Clearance delivery.
4. Control towers (CT).
5. Departure control.
6. Air route traffic control centers (ARTCC).
7. Flight service stations (FSS).
8. Approach control (AC).
9. Terminal control area (TCA).
10. Jet advisory service.
11. Radar traffic information service.
12. Traffic advisory practices at non-tower airports.

IV. WEATHER

A. The Earth's Atmosphere.
   1. Composition.
   2. Vertical structure.
   3. The standard atmosphere.
   4. Density.

B. Temperature.
   1. Temperature measurement.
   2. Heat and temperature.
   3. Temperature aloft.
   4. Temperature variation.

C. Atmospheric Pressure and Altimetry.
   1. Atmospheric pressure measurements.
   2. Sea level pressure.
   3. Station pressure.
   4. Pressure variations.
   5. Pressure systems.
   6. Altimeters.

D. Wind.
   1. Basic theory of general circulation.
   2. Convection.
   3. Pressure gradient force.
   4. Coriolis force.
   5. Friction.
   6. The jet stream.
   7. Local and small scale winds.
   8. Large wind system.
   9. Wind, pressure systems, and weather.
   10. Wind shear.

E. Moisture.
   1. Measurements -
      a. Relative humidity.
      b. Dewpoint.
   2. Change of state.
   3. Condensation and sublimation products.

F. Stability or Instability.
   1. Adiabatic process.
   2. Lapse rates.
   3. Stability determinations.
   4. Effects of stability or instability.

G. Clouds.
   1. Composition.
   2. Formation and structure.
   3. Types.
   4. Recognition.

H. Air Masses.
   1. Source regions.
   2. Classification of air masses.
   3. Air mass modification.
   4. Summer and winter air mass weather.

I. Fronts.
   1. Structure of fronts.
   2. Types of fronts.
   3. Frontal waves and occlusions.
   4. Frontolysis and frontogenesis.
   5. Associated weather.

J. Turbulence.
   1. Convective currents.
   2. Obstructions to wind flow.
   3. Wind shear.
   4. Clear air turbulence.
   5. Categories of turbulence intensities.
   6. Wake turbulence.

K. Icing.
   1. Structural ice formation.
   2. Ice producing cloud types.
   3. Accretion rate of in-flight structural icing.
   4. Types and intensities of in-flight structural icing.
   5. Effects of in-flight structural icing.
   6. Structural aircraft icing and frost.
   7. Structural anti-icing and deicing.
   8. Instrument and powerplant icing.

L. Thunderstorms.
   1. Conditions necessary for thunderstorm formation.
   2. Thunderstorm structure.
   3. Classification of thunderstorms.
   4. Thunderstorms hazards.
   5. Thunderstorm information from radar.
   6. Do's and don'ts of thunderstorm flying.
   7. Tornadoes.

M. Common IFR Producers.
   1. Fog.
   2. Low stratus clouds.
   3. Haze and smoke.
   4. Blowing obstructions to vision.
   5. Precipitation.
   6. Obscured or partially obscured sky.

N. National Weather Service.

O. Weather Observations.
   1. Surface weather observations.
   2. Pilot weather reports (PIREPS).
   3. Weather radar observations.
   4. Upper air observations.

P. Weather Charts.
   1. Weather depiction charts.
   2. Surface weather charts.
   3. Constant pressure charts.

4. Winds aloft charts.
5. Radar summary charts.
6. Prognostic surface and prognostic constant pressure charts.
7. Prognostic significant weather charts.

Q. Aviation Weather Forecasts.
1. Terminal forecasts.
2. Area forecasts.
3. Route forecasts.
4. Winds aloft forecasts.
5. In-flight weather advisories.
6. Severe weather outlooks.
7. Severe weather forecasts.
8. Surface analyses and prognoses.

R. Services to Pilot.
1. FSS briefing.
2. En route flight advisory service.
3. Transcribed weather broadcasts (TWEB).
4. Pilots automatic telephone weather answering service (PATWAS).

V. NAVIGATION

A. Navigation Computer Operation.
1. Calculator side -
a. Time, speed, and distance.
b. Fuel consumption.
c. Conversions:
(1) Scale: knots/mph.
(2) Temperature: Celsius/Fahrenheit.
(3) Time: hours/minutes/seconds.
(4) Airspeed:
(a) Indicated.
(b) Calibrated.
(c) Equivalent.
(d) True.
(5) Altitude:
(a) Indicated.
(b) True.
(c) Pressure.
(d) Density.
(e) Standard.
2. Wind face side -
a. Definitions:
(1) Courses.
(2) Headings.
(3) Bearings.
(4) Track.
b. Wind triangles on the computer.
3. Practice problems -
a. Time-speed-distance.
b. Fuel consumption.
c. True airspeed.
d. Compressibility.
e. Conversion.
f. True headings and groundspeeds.
g. Drift corrections.
h. Off-course corrections.
i. Variation and deviation.
j. Time and distance to radio stations.

B. Navigation Charts for Instrument Flight.
1. Area charts -
a. Purpose.
b. Legend.
2. En route low altitude -
a. Purpose.
b. Legend.
3. RNAV charts -
a. Purpose.
b. Legend.
4. Standard instrument departures (SIDs) -
a. Purpose.
b. Legend.
5. Standard terminal arrival routes (STARs) -
a. Purpose.
b. Legend.
6. Instrument approach procedure charts -
a. Purpose.
b. Legend.
c. Civil radar instrument approach minimums.
d. Nonstandard IFR takeoff minimums and departure procedures.
e. Nonstandard IFR alternate minimums.

C. Radio Navigation.
1. Basic principles of air navigation radio aids -
a. Nondirectional radiobeacon (NDB).
b. VHF omnidirectional range (VOR).
c. Distance measuring equipment (DME).
d. Area navigation (RNAV).
e. Class of NAVAIDS.
f. Marker beacons.
g. Instrument landing systems (ILS).
h. Simplified directional facility (SDF).
i. Maintenance of FAA NAVAIDS.
j. NAVAIDS with voice.
k. Radar control.
l. Air traffic control radar beacon system (ATCRBS).
m. Surveillance radar.
n. Precision radar.
2. Airport, air navigation lighting and marking aids -
a. Aeronautical (light) beacons.
b. Rotating beacons.
c. Auxiliary lights.
d. Obstruction lights.
e. Daylight beacon operation.

f. Lighted tetrahedron and traffic indicators.
g. Airway beacons.
h. Instrument approach light systems.
i. Runway edge light system.
j. Threshold lights.
k. In-runway lighting.
l. Control of lighting systems.
m. Visual approach slope indicator (VASI).
n. Runway end identified lights (REIL).
o. Runway marking.

D. Airborne Equipment.
1. Antennas and source of power.
2. Navigation receivers -
a. VOR/ILS.
b. ADF.
c. Marker beacons.
d. DME.
e. RNAV.
f. Transponder.
g. Radio magnetic indicator (RMI).
3. Communication -
a. Transmitters.
b. Receivers.
4. Integrated flight system (flight director systems) -
a. Nomenclature.
b. Principles of operation.

VI. OPERATIONS RELATED TO INSTRUMENT FLIGHT

A. Flight Instruments.
1. Pitot static instruments -
a. Pitot static system:
(1) Function.
(2) Construction.
(3) Operation.
b. Altimeter:
(1) Types of altimeters.
(2) Principles of operation.
(3) Use.
(4) Altitude definitions -
(a) Indicated.
(b) Pressure.
(c) True.
(d) Absolute.
(e) Density.
(5) Errors and corrections.
c. Vertical speed indicator:
(1) Principles of operation.
(2) Use.
(3) Limits and adjustment.
2. Gyroscopic instruments -
a. Systems operation:
(1) Suction.
(2) Electric.
b. Attitude indicator:
(1) Principles of operation.
(2) Use.
(3) Limitations and adjustments.
c. Heading indicator:
(1) Principles of operation.
(2) Use.
(3) Limitations and adjustments.
d. Turn indicators and inclinometer (ball):
(1) Types.
(2) Principles of operation.
(3) Use.
(4) Limitations.
3. Magnetic compass -
a. Earth's magnetic field.
b. Principles of operation.
c. Variation and deviation.
d. Magnetic dip.
e. Acceleration and deceleration errors.
f. Turning errors.

B. Aerodynamics Related to Instrument Flight.
1. Airfoils, relative wind, and angle of attack.
2. Aerodynamic forces during -
a. Straight-and-level flight.
b. Climbs.
c. Descents.
d. Turns.
3. Application of fundamental aerodynamics to basic maneuvers -
a. Straight-and-level flight:
(1) Airspeed.
(2) Air density.
(3) Aircraft weight.
b. Climbs/descents.
c. Power, airspeed, and vertical speed.
d. Power, airspeed, and elevator control.
e. Turns.
f. Trim:
(1) Slips/skids.
(2) Coordination.

C. Basic Instrument Flight.
1. Attitude instrument flying -
a. Cross-check (scanning).
b. Instrument interpretation.
c. Control.
2. Aircraft control -
a. Pitch control.
b. Bank control.
c. Power control.
d. Trim.
3. Basic maneuvers -
a. Straight-and-level flight:
(1) Instruments used.
(2) Change of airspeed.
(3) Common errors.
b. Straight climbs and descents:
(1) Constant airspeed.

(2) Constant rate.
(3) Absolute rate.
(4) Common errors.

c. Turns:
(1) Rate turns.
(2) Turns to predetermined headings.
(3) Time turns.
(4) Magnetic compass turns.
(5) Steep turns.
(6) Climbing and descending turns.
(7) Change of airspeed in turns
(8) Common errors.

d. Change of airspeed and configuration.

e. Stalls and recoveries from stalls.

f. Unusual attitudes and recoveries.

g. Instrument takeoff:
(1) Procedure.
(2) Common errors.

D. Radiotelephone Phraseology and Technique.
1. Contact procedure.
2. Microphone technique.
3. Aircraft call signs.
4. Ground station call signs.
5. Procedure words and phrases.
6. Figures.
7. Time.
8. Flight altitudes.
9. Degrees.
10. Phonetic alphabet.

E. Using the Navigation Instruments.
1. Very-high frequency omnirange (VOR) -
a. Frequency selection and tuning.
b. Types of indicators.
c. Orientation and interpretation.
d. Inbound and outbound tracking.
e. Track interception.
f. Time/distance.
g. Station passage.

2. Automatic direction finder (ADF) -
a. Selection of stations.
b. Frequency selection and timing.
c. Types of ADF indicators.
d. Orientation and interpretation.
e. Homing.
f. Inbound and outbound tracking.
g. Track interception.
h. Time/distance.
i. Station passage.

3. Instrument landing system (ILS) -
a. Frequency selection and tuning of components.
b. Orientation and interpretation of components.
c. Front and back course tracking with localizer.
d. Glide slope following.
e. Compass locators.
f. Associated lighting.

4. Distance measuring equipment (DME) -
a. Frequency selection and tuning.
B. Interpretation.

5. Radio magnetic indicators (RMI) -
a. Frequency selection and tuning.
b. Orientation and interpretation of components.

6. Area navigation (RNAV) -
a. Frequency and tuning.
b. Equipment display.
c. Way points.
d. Types.
e. Presentation:
(1) Course line.
(2) Distance.
(3) Vertical.

7. Integrated flight system (flight director system) -
a. Programing.
b. Interpretation components.

8. Airborne radar.

F. Preflight Planning for IFR Flight.
1. Weather briefing -
a. Sources of weather information.
b. Type of weather information needed.
c. Interpretation of combined weather reports and forecasts.
d. Application of weather information to safe operation.

2. Status of facilities and airways -
a. Airport/facility directory.
b. Notices to airmen (NOTAMS).
c. Restrictions to en route navigation.
d. Status of aids.
e. Special notices.
f. Preferred routes.
g. SIDs and STARs.
h. Substitute route structure.
i. Area navigation routes.
j. Charts:
(1) En route.
(2) Area.
(3) Approach.

3. Preparation of flight log -
a. Checkpoints.
b. Radio facility frequencies and identification.
c. Routing:
(1) Radials.
(2) Distances.
d. Estimated and actual groundspeed and time.
e. Alternate course of action.

4. Required information on flight plan-
   a. Type of flight plan:
      (1) Composite VFR-IFR.
      (2) IFR.
   b. Aircraft identification.
   c. Aircraft type/special equipment.
   d. True airspeed.
   e. Point of departure.
   f. Proposed time of departure.
   g. Selection of initial cruising altitude.
   h. Selection of route:
      (1) Airways.
      (2) Direct (off airway).
      (3) Noncontrolled airspace.
   i. Destination airport and city.
   j. Remarks.
   k. Estimated time en route.
   l. Fuel onboard.
   m. Alternate airport if required.
   n. Pilot's name and address.
   o. Number of persons aboard.
   p. Color of aircraft.
5. Filing an IFR flight plan.
6. Determining possible delays.
7. Aircraft performance -
   a. Takeoff distance.
   b. Climb performance.
   c. Cruise performance.
   d. Landing distance.
8. Aircraft operating limitations -
   a. Weight and balance.
   b. Instrument limit markings.
   c. Limiting placards.
   d. Turbulent air penetration.
   e. Maximum safe crosswinds.
9. Preflight action for aircraft -
   a. Documents.
   b. Equipment and systems.

G. Departure--IFR.
1. Pretakeoff procedures -
   a. Cockpit organization.
   b. Communication:
      (1) ATIS.
      (2) Clearance delivery.
      (3) Ground control.
   c. Clearance acceptance.
   d. Takeoff minimums.
2. Takeoff and departure procedures -
   a. Communication:
      (1) Tower.
      (2) Departure control.
      (3) Other.
   b. Takeoff and takeoff denial.
   c. Compliance with clearance.
   d. Departure:
      (1) Nontower, nonradar airports
      (2) Radar vectors.
      (3) Standard instrument departure.
   e. Transition to en route navigation.

H. En Route--IFR.
1. Procedures -
   a. Compliance with clearance.
   b. Normal navigation:
      (1) Communication.
      (2) Handoff.
   c. Radar environment:
      (1) Communication.
      (2) Handoff.
      (3) Use of transponder "IDENT".
   d. Altitudes:
      (1) Climbs/descents.
      (2) VFR on top.
      (3) Cruise.
      (4) Maintain.
      (5) Off-airways.
   e. Delays:
      (1) Clearance limit.
      (2) Holding.
2. Weather in flight -
   a. VFR/IFR.
   b. Weather services:
      (1) FSS scheduled and special broadcasts.
      (2) Automatic (TWEBs).
      (3) PIREPS.
   c. Effects on changing pressure and/or temperature on flight instruments.
   d. Effects of weather on aircraft performance.
   e. Effects of weather changes on flight.
3. Deviations from flight plan -
   a. Time/airspeed tolerances.
   b. Cancellation of IFR flight plan
   c. Change in alternate, altitude, or route.
4. Advance information on instrument approach.

I. Arrivals--IFR.
1. Transitions to approaches -
   a. Standard terminal arrival routes (STARs).
   b. Radar vectors.
   c. Normal navigation.
   d. Holding.
   e. Speed adjustments.
2. Communications -
   a. Airport terminal information service (ATIS).
   b. Airport advisory service.
   c. Approach control.
   d. Terminal radar service.
   e. Radar traffic information.
   f. Approach clearance.
   g. Control tower.
3. Instrument approach procedures -

a. Types:
   (1) ILS and LOC.
   (2) VOR and VOR/DME (TAC).
   (3) NDB (ADF).
   (4) Radar.
   (5) Timed.
   (6) Visual.
   (7) Contact.
   (8) Parallel ILS.
   (9) VHF/UHF direction finding.
   (10) RNAV.
   (11) SDF.
b. Approach minimums:
   (1) Straight in.
   (2) Circling.
   (3) Inoperative components.
c. Radar monitoring.
d. Landing priority.
e. Visual approach slope indicator (VASI).
f. Missed approach.

J. Unusual Flight Conditions.
   1. Wake turbulence -
      a. Causes.
      b. Avoidance.
   2. Midair collision avoidance.
   3. Emergency deviation -
      a. Thunderstorms.
      b. Icing.
      c. Turbulence.
   4. Communication failure -
      a. Route procedure.
      b. Altitude procedure.
      c. Approach procedure.
   5. Malfunction reports and equipment failure.
   6. Distress assistance.
   7. NTSB regulation, Part 830, rules pertaining to notification and reporting of aircraft accidents, incidents, and overdue aircraft -
      a. Immediate notification.
      b. Manner of notification.
      c. Reports.

# WRITTEN TEST SUBJECT MATTER OUTLINE

U.S. DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration
FLIGHT AND GROUND INSTRUCTOR KNOWLEDGE
Written Test Subject Matter Codes

**42 A**

USE ONLY TO IDENTIFY CODES, not as study outline, since all certificate and rating areas are combined. To determine the subject areas you missed, compare subject matter codes on your Airman Written Test Report, with coded items on this list. The total number of questions you missed is NOT reflected by the number of subject matter codes shown on the test report, since ONE OR MORE questions may have been asked in each item.

FEDERAL AVIATION REGULATIONS

PARTS 1; 71: DEFINITIONS/CONTROLLED AIRSPACE

A01 - Air commerce
A02 - Airport traffic area
A03 - Ceiling
A04 - Commercial operator
A05 - Flight level
A06 - Flight visibility
A07 - Interstate air commerce
A08 - Large aircraft
A09 - DH, MCA, MDA, MEA, MOCA, MRA, RVR
A10 - Major alteration
A11 - Major repair
A12 - Pilot in command
A13 - Second in command
A14 - Federal airway
A15 - Control area
A16 - Continental control area
A17 - Control zone
A18 - Route segment
A19 - Terminal control area
A20 - Positive control area

PART 61: CERTIFICATION: PILOTS/FLIGHT INSTRUCTORS

B01 - Required certificates/ratings
B02 - Certificates and ratings issued
B03 - Expired pilot certificates/reissuance
B04 - Carriage of narcotic drugs/marihuana
B05 - Duration of pilot certificates
B06 - Duration of medical certificates
B07 - General limitations
B08 - Pilot logbooks
B09 - Operations during medical deficiency
B10 - Second in command qualifications
B11 - Recent experience: Pilot in command
B12 - Pilot in command proficiency check
B13 - Falsification, reproduction, alteration
B14 - Change of address
B15 - Glider towing: experience/instruction
B16 - Private pilot privileges/limitations
B17 - Commercial pilot privileges/limitations
B18 - Instrument rating requirements

PART 91: GENERAL OPERATING RULES-SUBPART A

C01 - Responsibility of pilot in command
C02 - Pilot in command - more than one pilot
C03 - Preflight action
C04 - Flight crewmembers at stations
C05 - Interference with crewmembers
C06 - Careless or reckless operation
C07 - Liquor and drugs
C08 - Flights between Mexico/United States
C09 - Dropping objects
C10 - Fastening of safety belts
C11 - Parachutes and parachuting
C12 - Towing: gliders or other than gliders
C13 - Portable electronic devices
C14 - Simulated instrument and flight tests
C15 - ATC transponder equipment requirements
C16 - VOR equipment check for IFR operations
C17 - Fuel requirements - IFR conditions
C18 - Civil aircraft: certificates required
C19 - Special authorizations - foreign aircraft
C20 - Aircraft airworthiness
C21 - Aircraft operating limitations/markings
C22 - Supplemental oxygen
C23 - Instrument and equipment requirements
C24 - Flight recorders; cockpit voice recorders
C25 - Automatically reported altitude/pilot's reference
C26 - Transport airplane weight limitation
C27 - Maximum weights for airplanes in Alaska
C28 - Limited/restricted aircraft limitations
C29 - Experimental aircraft limitations
C30 - Special rules for foreign civil aircraft
C31 - Ferry flight with one engine inoperative
C32 - Emergency exits for airplanes
C33 - Aural speed warning device
C34 - Altitude alerting system or device
C35 - Emergency locator transmitters
C36 - Report: aircraft identification/activity

PART 91: GENERAL FLIGHT RULES-SUBPART B

D01 - Waivers
D02 - Operating near other aircraft
D03 - Right-of-way rules
D04 - Aircraft speed
D05 - Acrobatic flight
D06 - Aircraft lights
D07 - Complying - ATC clearances/instructions
D08 - ATC light signals
D09 - Minimum safe altitudes; general
D10 - Altimeter settings
D11 - Flight plan; information required
D12 - Operation - in vicinity of airport
D13 - Operation - airport with control tower
D14 - Operation - airport without tower
D15 - Flight in terminal control areas
D16 - Temporary flight restrictions
D17 - Flight test areas
D18 - Restricted and prohibited areas
D19 - Positive control areas; route segments
D20 - Jet advisory areas
D21 - Operations to, or over, Cuba
D22 - Flight limitation - space flight recovery
D23 - Operation: aircraft of Cuban registry
D24 - Flight restriction - Presidential/parties
D25 - Basic VFR weather minimums
D26 - Special VFR weather minimums
D27 - VFR cruising altitude or flight level
D28 - ATC clearance/flight plan required (IFR)
D29 - Takeoff/landing under IFR
D30 - Limitations-instrument approach procedure
D31 - Minimum altitudes for IFR operations
D32 - IFR cruising altitude/flight level
D33 - Course to be flown (IFR)
D34 - IFR radio communications
D35 - IFR two-way communications failure
D36 - Malfunction reports (IFR)
D37 - ATC transponder test/inspection

PART 91: MAINTENANCE, PREVENTATIVE MAINTENANCE, AND ALTERATIONS-SUBPART C

E01 - General maintenance and alterations
E02 - Maintenance required
E03 - Carrying persons after repair/alteration
E04 - Inspections/progressive inspection
E05 - Altimeter system tests/inspections
E06 - Maintenance records/transfer of records
E07 - Rebuilt engine maintenance records
E08 - ATC transponder test/inspection

PART 91: LARGE AND TURBINE-POWERED MULTIENGINE

NATIONAL TRANSPORTATION SAFETY BOARD

PART 430: NOTIFICATION AND REPORTING ACCIDENTS

H01 - Applicability
H02 - Definitions
H03 - Immediate notification and information
H04 - Preserving wreckage/mail/cargo/records
H05 - Reports/statements to be filed

FAA ADVISORY CIRCULARS

I01 - Series 00 General
I02 - Series 20 Aircraft
I03 - Series 60 Airmen
I04 - Series 70 Airspace
I05 - Series 90 Air Traffic Control and General Operations
I06 - Series 120 Air Carrier and Commercial Operators and Helicopters
I07 - Series 150 Airports
I08 - Series 170 Air Navigation Facilities

AIRMAN'S INFORMATION MANUAL

J01 - Glossary of aeronautical terms
J02 - Airport lighting/marking/aids
J03 - Air navigation radio aids
J04 - Visual approach slope indicator
J05 - Controlled/uncontrolled airspace
J06 - Operating at non-tower airports
J07 - Special use airspace-prohibited, restricted, ISJTA, alert areas
J08 - Automatic terminal information service
J09 - ATC departure/enroute/arrival procedures
J10 - Radar traffic information service
J11 - Stage I, II, III terminal radar service
J12 - Aeronautical advisory stations (UNICOM)
J13 - Radiotelephone phraseology/technique
J14 - Traffic/wind direction indicators
J15 - Obtaining weather information/briefing
J16 - Flight plans
J17 - VHF/UHF direction finder
J18 - ADIZ and designated mountainous areas
J19 - Medical facts for pilots
J20 - Good operating practices
J21 - Obtaining airport/heliport data
J22 - FSS/Weather Service telephone numbers
J23 - Obtaining radio facility/FSS data
J24 - Special notices/Special Operations
J25 - Notices to airmen (NOTAMS)
J26 - Terminal radar service areas
J27 - Terminal area graphic notices
J28 - Restrictions to enroute navigation aids
J29 - VOR receiver checkpoints
J30 - Parachute jumping areas

AVIATION WEATHER

K01 - Surface weather charts
K02 - Weather depiction charts
K03 - Prognostic charts
K04 - Significant weather charts
K05 - Pressure analyses charts
K06 - Winds aloft charts/forecasts
K07 - Radar summary charts/reports
K08 - Area forecasts
K09 - Terminal forecasts
K10 - Severe weather forecasts
K11 - Elements of forecasting
K12 - Aviation weather (sequence) reports
K13 - Inflight advisories (AIRMET/SIGMET)
K14 - Weather broadcasts-scheduled/advisories
K15 - Transcribed weather broadcasts (TWEB)
K16 - Significance of reported weather
K17 - Significance of cloud types
K18 - Determining cloud-heights
K19 - Recognition of critical weather
K20 - Temperature/dewpoint relationship
K21 - Fog types and their causes
K22 - Air mass characteristics
K23 - Frontal weather
K24 - Thunderstorms/squall lines
K25 - Aircraft icing
K26 - Standard temperatures/pressures
K27 - Standard lapse rates
K28 - Pressure systems/general circulation
K29 - Mountain effects/turbulence/weather
K30 - Information in a weather briefing
K31 - Soaring weather-thermals
K32 - Soaring weather-ridge lift
K33 - Soaring weather-mountain waves

NAVIGATIONAL - GENERAL

L01 - Sectional chart interpretation
L02 - Relating chart symbols to FAR
L03 - Pilotage/recognition of landmarks
L04 - Determining courses/distances on charts
L05 - Planning traffic pattern
L06 - Navigation computer principles
L07 - Computing headings/courses
L08 - Computing time, distance, speed, fuel
L09 - Computing rates of climb/descent
L10 - Computing wind direction/speed in flight
L11 - Computing off-course corrections
L12 - Selecting VFR cruising altitudes

RADIO NAVIGATION

M01 - Characteristics of VOR facilities
M02 - Tuning VOR receivers
M03 - Identifying VOR stations
M04 - VOR interpretation/orientation
M05 - Intercepting VOR radials
M06 - Tracking VOR radials
M07 - Groundspeed checks using VOR radials
M08 - VOR frequency interference
M09 - VOR test signals/VOR receiver checks
M10 - Characteristics of ADF facilities
M11 - Tuning ADF receivers
M12 - Identifying stations used for ADF
M13 - ADF/RMI interpretation/orientation
M14 - Intercepting ADF/RMI bearings
M15 - Tracking ADF/RMI bearings or "homing"
M16 - Marker beacons/outer compass locators

RADIO COMMUNICATIONS

N01 - VHF radio communications/phraseology
N02 - Position reporting procedures
N03 - Tower/FSS/enroute-advisories/instructions
N04 - FSS communications procedures
N05 - Obtaining emergency assistance
N06 - Lost procedure when radio is inoperative
N07 - Use of proper communications frequencies

AERODYNAMICS AND PRINCIPLES OF FLIGHT

O01 - Laws of motion
O02 - Functions of the flight controls
O03 - Principles of airfoils
O04 - Forces acting on the aircraft
O05 - Flight controls/axes of the aircraft
O06 - Lift/drag during turns
O07 - Lift versus angle of attack
O08 - Lift/thrust versus air density
O09 - Effect of ice/snow/frost on airfoils
O10 - Power versus climb/descent/level flight
O11 - Gyroscopic precession
O12 - Coning (helicopter)
O13 - Translating tendency (helicopter)
O14 - Ground effect
O15 - Translational lift (helicopter)
O16 - Transverse flow effect (helicopter)
O17 - Loads/load factors
O18 - Stability/controllability
O19 - Stall/spins
O20 - Effects of flaps, spoilers, dive brakes
O21 - Relative wind/angle of attack
O22 - Effect of wind during turns
O23 - Torque effects - P factor
O24 - Dissymmetry of lift (helicopter)

AIRCRAFT AND ENGINE OPERATION - GENERAL

P01 - Fuel injection/carburetor principles
P02 - Reciprocating engine principles
P03 - Preflight/postflight safety practices
P04 - Use of mixture/throttle/propeller control
P05 - Use of proper fuel grade/type
P06 - Fuel system operation
P07 - Engine starting/shutdown
P08 - Detonation cause/effect
P09 - Fuel contamination-prevention/elimination
P10 - Emergency-engine/systems/equipment/fire
P11 - Carburetor ice-cause/detection/elimination
P12 - Wake turbulence-causes/precautions
P13 - Crosswind takeoff/landing
P14 - Proper loading of the aircraft

P15 - Interpreting engine instruments
P16 - Ignition or electrical system/units
P17 - Recovery from critical flight situations
P18 - Carburetor heat effect on mixture
P19 - Aircraft operating limitations
P20 - Manifold pressure versus RPM
P21 - High altitude operations/pressurization
P22 - Use of oxygen and oxygen equipment
P23 - Mid-air collision avoidance precautions

AIRCRAFT/ENGINE PERFORMANCE - GENERAL

Q01 - Takeoff charts (airplane/rotorcraft)
Q02 - Rate of climb charts (airplane/rotorcraft)
Q03 - Cruise charts (airplane/rotorcraft)
Q04 - Maximum safe crosswind charts (airplane)
Q05 - Use of Denault computer (airplane)
Q06 - Landing charts (airplane/rotorcraft)
Q07 - Altitude-airspeed charts (rotorcraft)
Q08 - Stall speed charts (airplane)
Q09 - Hovering ceiling charts (rotorcraft)
Q10 - Airspeed correction charts (airplane)
Q11 - Predicting performance (helicopter)
Q12 - Computing density/pressure altitudes
Q13 - Effect of density altitude on performance
Q14 - Effect of weight/balance on performance
Q15 - Critical performance speeds - "V speeds"
Q16 - Effect of wind on aircraft performance
Q17 - Bank/speed versus rate/radius of turn
Q18 - Stall speed versus altitude or attitude
Q19 - Stall speed versus indicated/true airspeed
Q20 - Obstacle clearance takeoff/landing
Q21 - Best angle/best rate of climb (airplane)
Q22 - Computation of gross weight/useful load
Q23 - Computation of center gravity
Q24 - Minimum sink speed (glider)
Q25 - Glide ratio - L/D (glider)
Q26 - Speed-to-fly (glider)
Q27 - Best-glide-speed (glider)
Q28 - Glider performance curves (glider)
Q29 - Airspeed for searching for lift (glider)

FLIGHT INSTRUMENTS AND SYSTEMS

R01 - Attitude indicator operation/errors
R02 - Heading indicator operation/errors
R03 - Turn indicator/coordinator
R04 - Altimeter operation/errors
R05 - Vertical speed indicator operation/errors
R06 - Airspeed indicator operation/errors
R07 - Vacuum systems/instruments
R08 - Pitot-static systems/instruments
R09 - Magnetic compass operation/errors
R10 - Altimeter setting procedure/significance
R11 - Pressure altitude-significance/obtaining
R12 - Gyroscopic principles

INSTRUMENT FLYING PROCEDURES

S01 - Components of attitude instrument flying
S02 - Pitch, bank, power control
S03 - Straight-and-level flight
S04 - Turns/turns to predetermined headings
S05 - Constant rate climbs/descents/level offs
S06 - Constant speed climbs/descents/level offs
S07 - Magnetic compass turns
S08 - Effect of changes in airspeed
S09 - False sensations in flight
S10 - Recoveries from unusual attitudes/stalls
S11 - Visibility minimums
S12 - Interpreting SIDs/STARs
S13 - Interpreting enroute charts
S14 - Interpreting instrument approach charts
S15 - VOR instrument approach procedures
S16 - ADF instrument approach procedures
S17 - ILS/LOC instrument approach procedures
S18 - ASR instrument approach procedures
S19 - Use of VASI during approaches
S20 - Use of Distance Measuring Equipment
S21 - Radar vectoring procedures
S22 - Holding pattern - procedures/entries
S23 - Circling approach procedures
S24 - Missed approach procedures
S25 - DME arc initial approach procedures
S26 - Procedure turns (course reversal)

# AIRMAN WRITTEN TEST APPLICATION

## PRIVACY ACT STATEMENT

**The information on this form is required under the authority of the Federal Aviation Act (Section 602). Certification cannot be completed unless the data is complete.**

**Disclosure of your Social Security Account Number (SSAN) is optional. If you do not supply your SSAN, a substitute number or identifier will be assigned to give your record a unique 9-digit number for internal control of airman records.**

**If your SSAN has been previously given, it is already in the system. Requests for removal must be in writing. If you do not wish your SSAN on future records, please do not disclose SSAN on airman written test, airman certification, and/or medical certification applications.**

**Routine uses of records maintained in the system, including categories of users and the purposes of such uses: To determine that airmen are certified in accordance with the provision of the Federal Aviation Act of 1958. Repository of documents used by individual and potential employers to determine validity of airmen qualifications. To support investigative efforts of investigation and law enforcement agencies of Federal, State, and local Governments. Supportative information in court case concerning individual status and/or qualifications in law suits. To provide data for the Comprehensive Airman Information System (CAIS). To provide documents for microfilm and microfiche backup records.**

INSTRUCTIONS TO APPLICANT:

- ATTENTION: READ THE FOLLOWING PARAGRAPH CAREFULLY BEFORE COMPLETING THIS APPLICATION:

  WHOEVER, IN ANY MATTER WITHIN THE JURISDICTION OF ANY DEPARTMENT OR AGENCY OF THE UNITED STATES KNOWINGLY AND WILLFULLY FALSIFIES, CONCEALS OR COVERS UP BY ANY TRICK, SCHEME, OR DEVICE A MATERIAL FACT, OR MAKES ANY FALSE, FICTITIOUS OR FRAUDULENT STATEMENTS OR REPRESENTATIONS, OR MAKES OR USES ANY FALSE WRITING OR DOCUMENT KNOWING THE SAME TO CONTAIN ANY FALSE, FICTITIOUS OR FRAUDULENT STATEMENT OR ENTRY, SHALL BE FINED NOT MORE THAN $10,000 OR IMPRISONED NOT MORE THAN 5 YEARS, OR BOTH (U.S. CODE, TITLE 18, SEC. 1001.)

- CERTAIN TEST QUESTIONS INVOLVING REGULATIONS, ATC PROCEDURES, ETC., ARE FREQUENTLY OUTDATED BY VERY RECENT CHANGES. IN THESE INSTANCES, APPLICANTS ARE GIVEN CREDIT FOR THE QUESTION DURING THE PERIOD THAT IT TAKES TO DISTRIBUTE A REVISED QUESTION.

- DO NOT TEAR SHEETS APART.

* TURN TO PAGE 4 AND COMPLETE THE PERSONAL DATA SECTION. BE SURE THAT YOUR SIGNATURE IS ON THE PROPER LINE. BEFORE COMMENCING TEST, READ INSTRUCTIONS FOR MARKING THE ANSWER SHEET.

INSTRUCTIONS TO FAA PERSONNEL:

* REFER TO PAGE 3 OF THE APPLICATION FOR COMPLETION OF THE TIME WAIVER AND SECTION WAIVER BLOCK WHEN REQUIRED.

DEPARTMENT OF TRANSPORTATION — FEDERAL AVIATION ADMINISTRATION

# AIRMAN WRITTEN TEST APPLICATION

DATE OF TEST (MONTH | DAY | YEAR) | TITLE OF TEST | TEST NO.

PLEASE PRINT ONE LETTER IN EACH SPACE—LEAVE A BLANK SPACE AFTER EACH NAME

NAME (LAST, FIRST, MIDDLE) | DATE OF BIRTH (MONTH | DAY | YEAR)

MAILING ADDRESS NO. AND STREET, APT. #, P.O. BOX, OR RURAL ROUTE | DESCRIPTION (HEIGHT | WEIGHT | HAIR | EYES)

CITY, TOWN OR POST OFFICE, AND STATE | ZIP CODE

BIRTHPLACE (City and State, or foreign country) | CITIZENSHIP | SOCIAL SECURITY NO. | IF A SOCIAL SECURITY NUMBER HAS NEVER BEEN ISSUED CHECK THIS BLOCK →

Is this a retest? ☐ No ☐ Yes, date of last test | Have you taken or are you taking an FAA approved course for this test? ☐ No ☐ Yes *(If "yes" give details below)*

Graduation date: | NAME OF SCHOOL | CITY AND STATE

CERTIFICATION: I CERTIFY that all of the statements made in this application are true, complete, and correct to the best of my knowledge and belief and are made in good faith. Signature _____

— — DO NOT WRITE IN THIS BLOCK — — FOR USE OF FAA OFFICE ONLY — —

Applicant's identity established by:

| CARD A | | | | | | | | | | | CARD B | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CATEGORY | TEST NUMBER | TAKE NO. | SECTIONS 1 | 2 | 3 | 4 | 5 | 6 | 7 | EXPIRATION MONTH DAY YEAR | CERTIFICATED SCHOOL NUMBER | MECH EXP DATE BY SECTION 1 | 2 | 3 | ID | FIELD OFFICE DESIGNATION | SIGNATURE of FAA Representative |
| | | | | | | | | | | | | | | | | | |

INSTRUCTIONS FOR MARKING THE ANSWER SHEET. Completely darken only one circle for each question. DO NOT USE (X) OR (✓). Use black lead pencil furnished by examiner. To make corrections, open answer sheet so erasure marks will not show on page 2. Then erase incorrect response on page 4. On page 2 (copy) mark the incorrect response with a slash (/). Questions are arranged in VERTICAL sequence as indicated by the arrows.

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 ①②③④ | 23 ①②③④ | 45 ①②③④ | 67 ①②③④ | 89 ①②③④ | 111 ①②③④ | 133 ①②③④ |
| 2 ①②③④ | 24 ①②③④ | 46 ①②③④ | 68 ①②③④ | 90 ①②③④ | 112 ①②③④ | 134 ①②③④ |
| 3 ①②③④ | 25 ①②③④ | 47 ①②③④ | 69 ①②③④ | 91 ①②③④ | 113 ①②③④ | 135 ①②③④ |
| 4 ①②③④ | 26 ①②③④ | 48 ①②③④ | 70 ①②③④ | 92 ①②③④ | 114 ①②③④ | 136 ①②③④ |
| 5 ①②③④ | 27 ①②③④ | 49 ①②③④ | 71 ①②③④ | 93 ①②③④ | 115 ①②③④ | 137 ①②③④ |
| 6 ①②③④ | 28 ①②③④ | 50 ①②③④ | 72 ①②③④ | 94 ①②③④ | 116 ①②③④ | 138 ①②③④ |
| 7 ①②③④ | 29 ①②③④ | 51 ①②③④ | 73 ①②③④ | 95 ①②③④ | 117 ①②③④ | 139 ①②③④ |
| 8 ①②③④ | 30 ①②③④ | 52 ①②③④ | 74 ①②③④ | 96 ①②③④ | 118 ①②③④ | 140 ①②③④ |
| 9 ①②③④ | 31 ①②③④ | 53 ①②③④ | 75 ①②③④ | 97 ①②③④ | 119 ①②③④ | 141 ①②③④ |
| 10 ①②③④ | 32 ①②③④ | 54 ①②③④ | 76 ①②③④ | 98 ①②③④ | 120 ①②③④ | 142 ①②③④ |
| 11 ①②③④ | 33 ①②③④ | 55 ①②③④ | 77 ①②③④ | 99 ①②③④ | 121 ①②③④ | 143 ①②③④ |
| 12 ①②③④ | 34 ①②③④ | 56 ①②③④ | 78 ①②③④ | 100 ①②③④ | 122 ①②③④ | 144 ①②③④ |
| 13 ①②③④ | 35 ①②③④ | 57 ①②③④ | 79 ①②③④ | 101 ①②③④ | 123 ①②③④ | 145 ①②③④ |
| 14 ①②③④ | 36 ①②③④ | 58 ①②③④ | 80 ①②③④ | 102 ①②③④ | 124 ①②③④ | 146 ①②③④ |
| 15 ①②③④ | 37 ①②③④ | 59 ①②③④ | 81 ①②③④ | 103 ①②③④ | 125 ①②③④ | 147 ①②③④ |
| 16 ①②③④ | 38 ①②③④ | 60 ①②③④ | 82 ①②③④ | 104 ①②③④ | 126 ①②③④ | 148 ①②③④ |
| 17 ①②③④ | 39 ①②③④ | 61 ①②③④ | 83 ①②③④ | 105 ①②③④ | 127 ①②③④ | 149 ①②③④ |
| 18 ①②③④ | 40 ①②③④ | 62 ①②③④ | 84 ①②③④ | 106 ①②③④ | 128 ①②③④ | 150 ①②③④ |
| 19 ①②③④ | 41 ①②③④ | 63 ①②③④ | 85 ①②③④ | 107 ①②③④ | 129 ①②③④ | |
| 20 ①②③④ | 42 ①②③④ | 64 ①②③④ | 86 ①②③④ | 108 ①②③④ | 130 ①②③④ | |
| 21 ①②③④ | 43 ①②③④ | 65 ①②③④ | 87 ①②③④ | 109 ①②③④ | 131 ①②③④ | |
| 22 ①②③④ | 44 ①②③④ | 66 ①②③④ | 88 ①②③④ | 110 ①②③④ | 132 ①②③④ | |

SAMPLE

DEPARTMENT OF TRANSPORTATION – FEDERAL AVIATION ADMINISTRATION

# QUESTION SELECTION SHEET

## FII-1A

USE ONLY WITH FII QUESTION BOOK NO. 1*

| TITLE | TEST NO. |
|---|---|
| FLIGHT INSTRUCTOR INSTRUMENT (AIRPLANE) | 324096 |

NAME John Doe

**NOTE: IT IS PERMISSIBLE TO MARK ON THIS SHEET**

| On Answer Sheet For Item No. | Answer Question Number | On Answer Sheet For Item No. | Answer Question Number | On Answer Sheet For Item No. | Answer Question Number | On Answer Sheet For Item No. | Answer Question Number |
|---|---|---|---|---|---|---|---|
| 1 | 202 | 26 | 412 | 51 | 482 | 76 | 568 |
| 2 | 213 | 27 | 413 | 52 | 485 | 77 | 597 |
| 3 | 215 | 28 | 416 | 53 | 489 | 78 | 600 |
| 4 | 225 | 29 | 417 | 54 | 500 | 79 | 602 |
| 5 | 250 | 30 | 420 | 55 | 502 | 80 | 603 |
| 6 | 271 | 31 | 423 | 56 | 504 | 81 | 604 |
| 7 | 286 | 32 | 426 | 57 | 508 | 82 | 605 |
| 8 | 292 | 33 | 430 | 58 | 510 | 83 | 607 |
| 9 | 301 | 34 | 433 | 59 | 512 | 84 | 608 |
| 10 | 312 | 35 | 434 | 60 | 513 | 85 | 609 |
| 11 | 317 | 36 | 441 | 61 | 515 | 86 | 610 |
| 12 | 322 | 37 | 444 | 62 | 518 | 87 | 611 |
| 13 | 341 | 38 | 447 | 63 | 520 | 88 | 612 |
| 14 | 351 | 39 | 450 | 64 | 523 | 89 | 613 |
| 15 | 370 | 40 | 452 | 65 | 525 | 90 | 614 |
| 16 | 374 | 41 | 455 | 66 | 529 | 91 | 615 |
| 17 | 378 | 42 | 458 | 67 | 533 | 92 | 616 |
| 18 | 382 | 43 | 461 | 68 | 540 | 93 | 617 |
| 19 | 388 | 44 | 464 | 69 | 541 | 94 | 618 |
| 20 | 390 | 45 | 467 | 70 | 542 | 95 | 619 |
| 21 | 396 | 46 | 470 | 71 | 544 | 96 | 621 |
| 22 | 402 | 47 | 473 | 72 | 547 | 97 | 622 |
| 23 | 407 | 48 | 478 | 73 | 549 | 98 | 624 |
| 24 | 410 | 49 | 480 | 74 | 551 | 99 | 625 |
| 25 | 411 | 50 | 481 | 75 | 554 | 100 | 626 |



*For Official Use Only*

# FLIGHT INSTRUCTOR INSTRUMENT-AIRPLANE

## WRITTEN TEST GUIDE

001. To act as pilot in command under Instrument Flight Rules, a pilot must have passed an instrument competency check within the past 6 months or have logged at least

B11 1- 3 hours of instrument time, 1 of which must be in flight, and at least three instrument approaches.
2- 6 hours of instrument time, 3 of which must be under actual or simulated IFR conditions.
3- 3 hours of instrument time which must be in flight and at least three instrument approaches.
4- six instrument approaches and 6 hours of instrument time, 3 hours of which were flown in the category of aircraft involved.

002. To remain current for IFR operations the minimum required instrument experience during the past 6 months is

B11 1- six instrument approaches and 6 hours of instrument time in any aircraft.
2- six instrument approaches and 6 hours of instrument time; 3 hours of instrument time must be in the category of aircraft to be flown.
3- six instrument approaches, three of which must be in the same category and class of aircraft to be flown, and 6 hours of instrument time in any aircraft.
4- six instrument approaches, three of which must be in the same category of aircraft to be flown; 6 hours of instrument time, 3 hours of which must be the same category of aircraft to be flown.

003. ATC may assign the MOCA when certain special conditions exist, and when within

A09 1- 22 NM of the VOR.
2- 25 NM of the VOR.
3- 30 NM of the VOR.
4- 35 NM of the VOR.

004. Without special authorization from the FAA Administrator, to act as pilot in command of a multiengine turbojet powered airplane operating under IFR, a certificated pilot is required to hold

B07 1- an airline pilot rating.
2- a commercial pilot rating.
3- a type rating for that airplane.
4- only a multiengine class rating.

005. Assume a pilot failed to meet the recent instrument experience required during the prescribed time or 6 months thereafter. Prior to acting as pilot in command under IFR, that pilot must pass an instrument competency check

B11 1- in any category of aircraft.
2- in the category of aircraft involved.
3- which is conducted by an FAA inspector.
4- which includes an ADF, VOR, and ILS approach.

006. An instrument competency check must be passed prior to acting as pilot in command under IFR, if that pilot has not met the recent experience requirements of FAR, Part 61, within the past

B11 1- 3 months.
2- 6 months.
3- 9 months.
4- 12 months.

007. If no MCA is specified, what is the lowest altitude for crossing a radio fix, beyond which a higher minimum applies?

A09 1- The MEA at which the fix is approached.
2- The MRA at which the fix is approached.
3- The MAA for the route segment beyond the fix.
4- The MOCA for the route segment beyond the fix.

008. MOCA is a specified minimum altitude in effect between radio fixes which meets obstruction clearance requirements, and

A09 1- will not be assigned by ATC unless the pilot specifically requests it.
2- is the highest altitude authorized for IFR on a particular route segment.
3- assures acceptable navigational signal coverage only within 22 NM of the VOR.
4- indicates that a lower MEA has been established for that route segment, but will not provide signal coverage.

009. How much time, after your instrument recent experience lapses, do you have before you must pass an instrument competency check to act as pilot in command under IFR?

B11 1- 90 days.
2- 6 months.
3- 12 months.
4- 24 months.

010. Reception of signals from a radio facility, located off the airway being flown, may be inadequate at the designated MEA to identify the fix. In this case, which altitude is designated for the fix?

A09 1- MRA.
2- MAA.
3- MCA.
4- MOCA.

011. What portion of dual instruction time may a certificated instrument flight instructor log as instrument flight time?

B08 1- All time during which the instructor acts as pilot in command during an instrument training flight.
2- All time during which the instructor acts as instrument instructor, regardless of weather conditions.
3- All time during which the instructor acts as instrument instructor in actual instrument weather conditions.
4- Only the time during which the instructor flies the aircraft by reference to instruments.

012. Assume that a pilot has failed to meet the recent instrument experience requirements within the past 14 months. To act as pilot in command in weather conditions less than the minimums prescribed for VFR, that pilot must

B11 1- pass an instrument competency check in the category of aircraft involved.
2- pass an instrument check in any category of aircraft.
3- log at least 6 hours of instrument time, 3 of which must be under actual or simulated IFR conditions.
4- log at least 6 hours of instrument time, 3 of which must be in flight, and at least six instrument approaches.

013. As used in aviation, "flight visibility" means

A06 1- the average visibility in all directions as seen from the cockpit of an aircraft in flight.
2- the average slant range distance that the pilot can see from the cockpit of an aircraft in flight to the ground.
3- the prevailing horizontal visibility near the earth's surface as reported by the United States National Weather Service or an accredited observer.
4- the average forward horizontal distance, from the cockpit of an aircraft in flight, at which prominent objects, unlighted by day and lighted by night, may be seen.

014. For a flight below 18,000 feet MSL, which of the following operations would require the pilot in command to be instrument rated?

B01 1- Any flight in controlled airspace which is being controlled by ATC.
2- Any flight operation where the pilot in command controls the airplane solely by reference to the flight instruments.
3- A flight operation in weather conditions less than the minimums prescribed for VFR flight or under instrument flight rules.
4- A flight operation in a control zone, carrying passengers in weather conditions that are less than basic VFR.

015. Acceptable navigational signal coverage at the MOCA is assured for a distance from the VOR of only

A09 1- 12 NM.
2- 22 NM.
3- 25 NM.
4- 30 NM.

016. What minimum navigational equipment is required for IFR flights?

C23 1- VOR, ADF, and ILS receivers.
2- VOR receiver, transponder, and DME.
3- Navigation equipment appropriate to the ground facilities used.
4- VOR receiver and, if in ARTS III environment, a coded transponder equipped for altitude reporting.

017. In addition to date and signature, which of the following should be recorded by the person performing a VOR operational check?

C16 1- Bearing error, and location where check was performed.
2- Flight hours and number of days since last check, and bearing error.
3- Frequency, radial and facility used, and bearing error.
4- Tachometer reading, approval or disapproval of the VOR receiver, and the frequency used.

018. A coded transponder equipped with altitude reporting equipment is required for Group I TCAs and all controlled airspace

C15 1- except Control Zones.
2- above 12,500 feet MSL.
3- below 14,500 feet MSL.
4- above 2,500 feet above the surface.

019. What are the standard alternate minimums that must be forecast at the ETA for an alternate airport that has no approved instrument approach?

D11 1- 600-foot ceiling and 2 miles visibility.
2- 800-foot ceiling and 2 miles visibility.
3- 1,000-foot ceiling and 1 mile visibility.
4- Adequate ceiling and visibility to allow descent from MEA, approach, and landing under basic VFR.

020. What are the minimum fuel requirements for a flight in IFR conditions, if the first airport of intended landing is forecast to have a 1,500-foot ceiling and 3 miles visibility at flight planned ETA?

C17 1- Enough fuel to fly to the first airport of intended landing.
2- Enough fuel to fly to the first airport of intended landing, and then fly to an alternate within 45 minutes at normal cruising speed.
3- Enough fuel to fly to the first airport of intended landing, fly to the alternate, and then fly thereafter for 45 minutes at normal cruising speed.
4- Enough fuel to fly to the first airport of intended landing, then fly thereafter for 45 minutes at normal cruising speed.

021. The fuel requirements for flight in IFR conditions when no alternate airport is required, must be sufficient to fly to the first airport of intended landing and for how long thereafter?

C17 1- 30 minutes at normal cruising speed.
2- 45 minutes at normal cruising speed.
3- 45 minutes at slow cruising speed.
4- 1 hour at normal cruising speed.

022. What is the acceptable range of accuracy, when making a VOR receiver check using a VOT?

C16 1- 176° to 184° "TO."
2- 178° to 182° "FROM."
3- 354° to 006° "FROM."
4- 356° to 004° "TO."

023. Suppose during a VOT check of the VOR equipment, the Course Deviation Indicator centers on 356° with the TO-FROM reading "FROM." This VOR equipment may

C16 1- be used if -4° is entered on a correction card and subtracted from all VOR courses.
2- be used during IFR flights, since the error is within limits.
3- not be used during IFR flights, since the TO-FROM should read TO.
4- not be used during IFR flights, unless the aircraft is equipped with a dual VOR system.

024. Suppose that during a VOT check of the VOR equipment, the Course Deviation Indicator centers on 184° with the TO-FROM reading "TO." This VOR equipment may

C16 1- be used if +4° is entered on a correction card and added to all VOR courses.
2- be used during IFR flights, since the error is within limits.
3- not be used during IFR flights, unless the aircraft is equipped with a dual VOR system.
4- not be used during IFR flights, since the TO-FROM should read FROM.

025. In which of the following instrument flight situations is DME required?

C23 1- Flight in Terminal Control Areas.
2- Flight in Positive Control Areas.
3- Flight above 18,000 feet MSL.
4- Flight above 24,000 feet MSL when VOR navigational equipment is required.

026. What is the maximum tolerance for a dual VOR equipment check while airborne?

C16 1- 4° between the indicated bearings to the station.
2- 6° between the indicated bearings to the station.
3- Plus or minus 2° between the indicated bearings to the station.
4- Plus or minus 6° between the indicated bearings to the station.

027. Suppose the dual system of checking one VOR system against the other is used prior to an IFR flight. The maximum permissible variation between the two indicated bearings is

C16 1- 2°.
2- 4°.
3- 6°.
4- 8°.

028. If an airborne checkpoint is used to check the VOR system for IFR operations, the maximum bearing error permissible is

C16 1- plus 4°; minus 6°.
2- plus or minus 6°.
3- plus 6°; minus 4°.
4- plus or minus 4°.

029. Suppose that while taxiing for takeoff you note the Vertical Speed Indicator indicates a descent of 100 feet per minute. In this case, if your flight is to be in IFR conditions, you

C23 1- may take off and use 100 feet per minute descent as the zero indication.
2- must have the instrument corrected by an authorized repairman prior to flight.
3- may take off without any correction, because this instrument is used very little during instrument flight.
4- may not take off until the instrument is corrected by either the pilot or a mechanic.

030. An airplane is required to be equipped with an operable 4096 transponder with Mode "C" capability when operating in

C15 1- controlled airspace above 10,000 feet MSL.
2- all airspace above 10,000 feet MSL.
3- all airspace above 12,000 feet MSL that is not in the Continental Control Area.
4- controlled airspace above 12,500 feet MSL.

031. If during IFR conditions, you will be departing from an airport located outside controlled airspace, you must file an IFR flight plan and receive a clearance before

D28 1- takeoff.
2- entering controlled airspace.
3- operating the airplane with reference to instruments.
4- entering an area where the visibility is less than 1 mile.

032. What is the maximum tolerance allowed for an operational VOR equipment check when using a VOT?

C16 1- Plus or minus 2°.
2- Plus or minus 4°.
3- Plus or minus 6°, if one receiver is checked against the other.
4- Plus or minus 4° for a check while on the ground, and 6° while airborne.

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

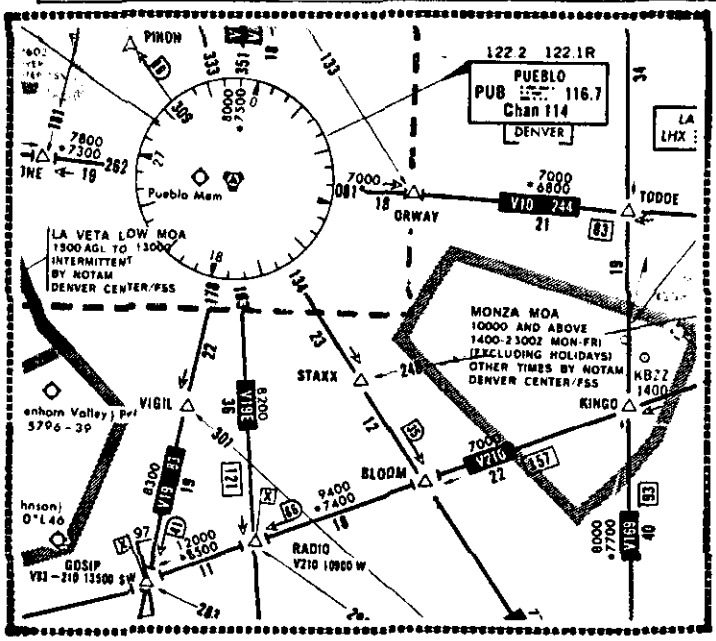
**FLIGHT PLAN**

CIVIL AIRCRAFT PILOTS. FAR Part 91 requires you file an IFR flight plan to operate under instrument flight rules in controlled airspace. Failure to file could result in a civil penalty not to exceed $1,000 for each violation (Section 901 of the Federal Aviation Act of 1958, as amended). Filing of a VFR flight plan is recommended as a good operating practice. See also Part 99 for requirements concerning DVFR flight plans.

| 1. TYPE | 2. AIRCRAFT IDENTIFICATION | 3. AIRCRAFT TYPE/ SPECIAL EQUIPMENT | 4. TRUE AIRSPEED | 5. DEPARTURE POINT | 6. DEPARTURE TIME | | 7. CRUISING ALTITUDE |
|---|---|---|---|---|---|---|---|
| | | | | | PROPOSED (Z) | ACTUAL (Z) | |
| VFR | | | | | | | |
| X IFR | N211Y | AIR REAMER 250/A | 150 KTS | PUB | 1400 | | 12,000 |
| DVFR | | | | | | | |

8. ROUTE OF FLIGHT

V10 TODDE, V169 KINGO, V210 GOSSIP, V19 PUB




CLEARANCE #1 PRIOR TO TAXI.

AIR REAMER TWO ONE ONE TWO YANKEE CLEARED AS FILED - MAINTAIN SEVEN THOUSAND - MAINTAIN RUNWAY HEADING FOR VECTOR TO VICTOR TEN - DEPARTURE CONTROL WILL BE ONE TWO ZERO POINT NINE - SQUAWK ZERO SEVEN ZERO ZERO.

CLEARANCE #2 AFTER TAKEOFF AND ESTABLISHED ON V10.

AIR REAMER TWO ONE ONE TWO YANKEE REPORT LEAVING SIX THOUSAND - EXPECT FURTHER CLEARANCE TO EIGHT THOUSAND AT ORWAY INTERSECTION - CONTACT DENVER CENTER ON ONE TWO SIX POINT SIX.

## FIG-1

033. Refer to Fig. 1. If two-way communications is lost after receiving clearances 1 and 2, and you are in IFR conditions, what altitudes should be flown on the indicated route of flight?

D35 1- 7,000 feet from ORWAY to BLOOM; cross RADIO at or above 12,000 feet, descend to 7,000 feet after passing GOSIP.
2- 8,000 feet for the entire flight until necessary to descend for the approach.
3- 8,000 feet from ORWAY to BLOOM; 9,400 feet from BLOOM, cross RADIO at or above 10,900 feet; 12,000 feet between RADIO and GOSIP; descend to 8,300 feet after passing GOSIP.
4- 12,000 feet from ORWAY to GOSIP; 8,300 feet after passing GOSIP.

034. If, while in controlled airspace, a clearance is received to "maintain VFR conditions-on-top," the pilot should maintain a VFR cruising altitude based on the direction of the

D31 1- true course.
2- true heading.
3- magnetic course.
4- magnetic heading.

035. Refer to Fig. 1. If two-way communications is lost after receiving clearance #2, and you are in IFR conditions, what altitude should be flown from ORWAY to BLOOM?

D35 1- 7,000 feet.
2- 8,000 feet.
3- 10,000 feet.
4- 12,000 feet.

036. When must a VOR system be given an operational test to be current for instrument flight?

C16 1- Within the preceding 10 hours of flight time or 20 days.
1- Within the preceding 30 days.
3- Every 10 hours of flight time or 10 days of operation.
4- Within the preceding 10 hours of flight time and 10 days.

037. When must an operational check on the aircraft VOR equipment be accomplished to operate under IFR

C16 1- Within the preceding 30 days.
2- Every 10 days of operation and 10 hours of flight time.
3- Each 10 days of operation or 10 hours of flight time, whichever occurs last.
4- Each 10 days of operation or 10 hours of flight time, whichever occurs first.

038. In which of the following airspaces are "VFR on Top" operations prohibited?

D19 1- When flying through a TCA.
2- In controlled airspace.
3- In Positive Control Airspace.
4- On that part of a flight through a control zone.

039. What are the standard alternate minimums that must be forecast at the ETA for an airport that has a precision approach procedure?

D11 1- 600-foot ceiling and 2 miles visibility.
2- 800-foot ceiling and 2 miles visibility.
3- 1,000-foot ceiling and 1 mile visibility.
4- Adequate ceiling and visibility to allow descent from MEA, approach, and landing under basic VFR.

040. Of the following situations, when is DME required for instrument flight?

C23 1- In Positive Control Areas.
2- In all airspace above 18,000 feet MSL.
3- In Terminal Control Areas.
4- Above 24,000 feet MSL when VOR navigational equipment is required.

041. Which airspace requires filing an IFR flight plan?

D28 1- Any airspace when the visibility is less than 1 mile.
2- Controlled airspace with IFR weather conditions and Positive Control Area.
3- Continental Control Area, Terminal Control Area, and airspace with IFR conditions.
4- Any airspace above 700 feet, or 1,200 feet where designated, if the visibility is less than 1 mile.

042. To omit the listing of an alternate on an IFR flight plan, which of the following factors must exist at the first airport of intended landing?

D11 1- A ceiling and visibility which will allow a descent from the MEA in VFR conditions.
2- A ceiling 1,000 feet above the highest MEA, MOCA, or initial approach altitude.
3- A ceiling of at least 2,000 feet and visibility of at least 3 miles.
4- A ceiling of at least 2,000 feet above the lowest MEA, MOCA, or initial approach altitude.

043. The Minimum En Route Altitude (MEA) is an altitude which assures

D31 1- a 500-foot clearance above the highest obstacle and an accurate navigational signal between VORTACs.
2- obstacle clearance, accurate navigational signals from more than one VORTAC, and accurate DME mileage.
3- a 1,000-foot obstacle clearance within 2 miles of an airway and assures accurate DME mileage.
4- acceptable navigational signal coverage and meets obstruction clearance requirements.

044. To operate an airplane under IFR, a flight plan must have been filed and an ATC clearance received prior to

D28 1- entering controlled airspace.
2- entering clouds.
3- takeoff.
4- entering weather conditions below VFR minimums.

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

**FLIGHT PLAN**

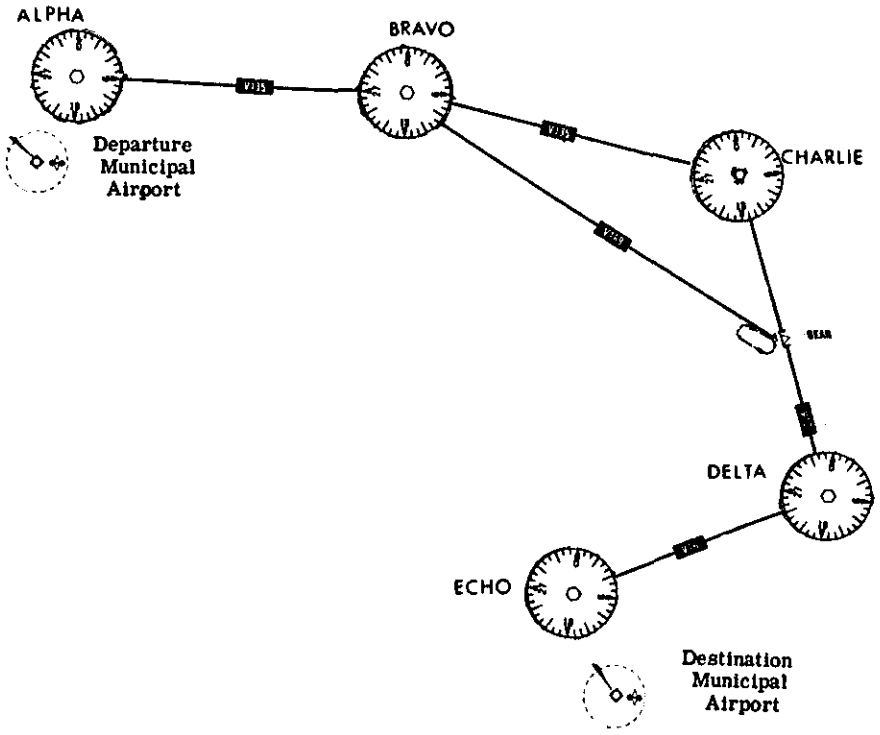
CIVIL AIRCRAFT PILOTS. FAR Part 91 requires you file an IFR flight plan to operate under instrument flight rules in controlled airspace. Failure to file could result in a civil penalty not to exceed $1,000 for each violation (Section 901 of the Federal Aviation Act of 1958, as amended). Filing of a VFR flight plan is recommended as a good operating practice. See also Part 99 for requirements concerning DVFR flight plans.

| 1. TYPE | 2. AIRCRAFT IDENTIFICATION | 3. AIRCRAFT TYPE/ SPECIAL EQUIPMENT | 4. TRUE AIRSPEED | 5. DEPARTURE POINT | 6. DEPARTURE TIME | | 7. CRUISING ALTITUDE |
|---|---|---|---|---|---|---|---|
| | | | | | PROPOSED (Z) | ACTUAL (Z) | |
| VFR | | | | | | | |
| X IFR | N-1211P | AIR REAMER 250/A | 150 KTS | DEPARTURE MUNICIPAL AIRPORT | 1600 | | 5,000 |
| DVFR | | | | | | | |

8. ROUTE OF FLIGHT

ALPHA VOR V-135 CHARLIE VORTAC

V-12 DELTA VOR V-16 ECHO VOR




CLEARANCE #1

AIR REAMER ONE ONE PAPA - CLEARED TO DESTINATION MUNICIPAL AIRPORT - AS FILED - MAINTAIN FIVE THOUSAND.

CLEARANCE #2

AIR REAMER ONE ONE PAPA - CLEARED TO BRAVO VOR - EXPECT FURTHER CLEARANCE PRIOR TO BRAVO VOR - MAINTAIN FIVE THOUSAND.

CLEARANCE #3

AIR REAMER ONE ONE PAPA - CLEARED TO BRAVO VOR - EXPECT FURTHER CLEARANCE VIA VICTOR ONE SIXTY NINE BEAR - VICTOR TWELVE DELTA - VICTOR SIXTEEN ECHO - DIRECT DESTINATION - MAINTAIN FIVE THOUSAND.

CLEARANCE #4 RECEIVED AFTER PASSING DELTA VOR.

AIR REAMER ONE ONE PAPA - TURN LEFT TWO ONE ZERO FOR VECTOR TO DESTINATION INITIAL APPROACH FIX.....

**FIG-2**

045. Refer to Fig. 2, and clearance 1. If two-way radio failure occurs in IFR conditions after takeoff, which route should the pilot fly?

D35 1- ALPHA VOR direct to ECHO VOR.
2- ALPHA VOR V-135 CHARLIE VORTAC V-12 DELTA VOR V-16 ECHO VOR.
3- ALPHA VOR V-135 BRAVO VOR V-169 DELTA VOR V-16 ECHO.
4- ALPHA VOR direct to Destination Municipal Airport.

046. Refer to Fig. 2, and clearance 2. If two-way radio failure occurs in IFR conditions after takeoff and prior to receiving the further clearance, which route should the pilot fly?

D35 1- ALPHA VOR V-135 CHARLIE VORTAC V-12 DELTA VOR V-16 ECHO VOR.
2- ALPHA VOR V-135 BRAVO VOR V-169 DELTA VOR V-16 ECHO VOR.
3- ALPHA VOR direct to ECHO VOR.
4- Direct to BRAVO VOR V-169 DELTA VOR V-16 ECHO VOR.

047. Refer to Fig. 2, and clearance 4. If, while in IFR conditions, two-way radio communications is lost after receiving this clearance, what route should the pilot fly?

D35 1- Proceed direct to destination.
2- Proceed on V-16 to ECHO then direct to destination.
3- Intercept the 210 radial of Delta VOR, then direct to destination.
4- Proceed to ECHO then intercept the destination ILS course.

048. The UHF glide slope transmitter of the "ILS" operates within which of the following frequency ranges?

J03 1- 310.15 MHz to 320.00 MHz.
2- 312.15 kHz to 321.55 kHz.
3- 329.15 MHz to 335.00 MHz.
4- 332.00 kHz to 336.95 kHz.

049. Where can you find the latest FDC NOTAMS?

J25 1- Any ATC facility.
2- Any FAA Flight Service Station.
3- Part 3A of the Airman's Information Manual.
4- In the NOS Instrument Approach Procedure Chart folder for the particular region.

050. Refer to Fig. 2, and clearance 3. If, while in IFR conditions, two-way radio communications is lost after receiving this EFC clearance, and prior to reaching BRAVO VOR, what route should the pilot fly?

D35 1- BRAVO VOR V-169 BEAR V-12 DELTA V-16 ECHO direct to destination.
2- BRAVO VOR V-135 CHARLIE V-12 DELTA V-16 ECHO VOR direct to destination.
3- BRAVO VOR direct to ECHO VOR direct to destination.
4- BRAVO direct to destination.

051. In the case of operations over an area designated as a mountainous area where no other minimum altitude is prescribed, no person may operate an aircraft under IFR below an altitude of

D31 1- 500 feet above the highest obstacle.
2- 1,000 feet above the highest obstacle.
3- 2,000 feet above the highest obstacle.
4- 3,000 feet above the highest obstacle.

052. In the case of operations over an area designated as a mountainous area, no person may operate an aircraft under IFR below 2,000 feet above the highest obstacle within a horizontal distance of

D31 1- 2 statute miles from the course flown.
2- 3 statute miles from the course flown.
3- 4 statute miles from the course flown.
4- 5 statute miles from the course flown.

053. No person may operate a civil aircraft under IFR using the VOR system of radio navigation, unless the VOR equipment of that aircraft has been operationally checked within the preceding

C16 1- 10 hours of flight time and within 10 days before the flight.
2- 10 hours of flight time and within 30 days before the flight.
3- 24 hours of flight time and within 10 days before the flight.
4- 30 days before the flight.

054. What are the standard alternate minimums that must be forecast at the ETA for an airport that has only a nonprecision approach procedure?

D11 1- 600-foot ceiling and 2 statute miles visibility.
2- 800-foot ceiling and 2 statute miles visibility.
3- 1,000-foot ceiling and 1 statute mile visibility.
4- Adequate ceiling and visibility to allow descent from MEA, approach, and landing under basic VFR.

055. An airport without an authorized instrument approach procedure may be included on an IFR flight plan as an alternate, if the current weather forecast indicates that the ceiling and visibility at the ETA will

D12 1- be at least 300 feet and 2 miles.
2- be at least 600 feet and 2 miles.
3- be at least 1,000 feet and 1 mile.
4- allow for a descent from the MEA, approach, and a landing under basic VFR.

056. An IFR flight plan must be filed and an appropriate ATC clearance received, prior to

D28 1- flying solely by reference to instruments in controlled airspace.
2- entering weather conditions below VFR minimums.
3- takeoff, if IFR weather conditions exist.
4- entering controlled airspace when IFR conditions exist.

057. The term "cruise" may be used by ATC in a clearance, to signify to the pilot that

J01 1- climb to or descend from the assigned altitude may be commenced at the pilot's discretion.
2- descend from and return to the assigned altitude may be commenced at the pilot's discretion without further ATC clearance.
3- ATC approval is required for the pilot to proceed to and make an approach at the destination airport.
4- any altitude not exceeding the assigned altitude may be selected at the pilot's discretion, but a clearance must be obtained prior to descending from that altitude.

058. Where are IFR flight operations required during VFR weather conditions?

D19 1- Group I TCA.
2- Transition Area.
3- Positive Control Airspace.
4- Continental Control Area and Positive Control Area.

059. To operate under IFR below 18,000 feet, a pilot must file an IFR flight plan and receive an appropriate ATC clearance prior to

D28 1- takeoff.
2- entering controlled airspace.
3- entering weather conditions below VFR minimums.
4- flying by reference to instruments in controlled airspace.

060. If during a VFR practice instrument approach, Radar Approach Control assigns an altitude or heading that will cause you to enter the clouds, what action should be taken?

D28 1- Abandon the approach.
2- Enter the clouds, since ATC provides separation from other traffic.
3- Enter the clouds, since ATC authorization for practice approaches is considered an IFR clearance.
4- Avoid the clouds and inform ATC that altitude/heading will not permit VFR.

061. Immediately after passing the final approach fix inbound during an ILS approach in IFR conditions, the glide slope warning flag appears. The pilot is

D31 1- required to immediately begin the prescribed missed approach procedure.
2- permitted to continue the approach and descend to the DH.
3- required to immediately abandon the approach and climb straight ahead.
4- permitted to continue the approach and descend to the localizer MDA.

062. If the static pressure system and altimeter were tested and inspected on April 10, 1979, the next inspection on these systems would be due

E05 1- April 10, 1980.
2- April 30, 1980.
3- April 10, 1981.
4- April 30, 1981.

063. If the RVR equipment is inoperative for an instrument approach procedure that requires a visibility of 2,400 RVR, how should the pilot expect the visibility requirement to be reported in lieu of the published RVR?

D29 1- As a ground visibility of 1/4 statute mile.
2- As a ground visibility of 1/2 statute mile.
3- As a slant range visibility of 2,400 feet.
4- As an RVR of 2,400 feet.

064. If during an ILS approach in IFR conditions, the approach lights are not visible upon arrival at the DH, the pilot is

D31 1- required to immediately execute the missed approach procedure.
2- required to immediately abandon the approach and climb straight ahead on the localizer course.
3- permitted to continue the approach and descend to the localizer MDA.
4- permitted to continue the approach to the approach threshold of the ILS runway.

065. When must an aircraft altimeter systems test and inspection for an IFR flight be accomplished?

E05 1- Within the preceding 12 calendar months.
2- Within the preceding 24 calendar months.
3- At each annual aircraft inspection.
4- At each 100-hour aircraft inspection.

066. NOTAM information which contains time-critical information which could affect a pilot's decision to make a flight, is classed as

J01 1- NOTAM (A) information.
2- NOTAM (C) information.
3- NOTAM (D) information.
4- NOTAM (L) information.

067. NOTAM information which is primarily of an advisory nature is classed as

J01 1- NOTAM (A) information.
2- NOTAM (C) information.
3- NOTAM (D) information.
4- NOTAM (L) information.

068. What obstacle clearance and navigation signal coverage is a pilot assured with the Minimum Sector Altitudes depicted on the instrument approach procedure charts?

D31 1- 500 feet and acceptable navigation signal coverage with a 10-mile radius of the navigation facility.
2- 500 feet within a 10-mile radius of the navigation facility but not acceptable navigation signal coverage.
3- 1,000 feet and acceptable navigation signal coverage within a 25-mile radius of the navigation facility.
4- 1,000 feet within a 25-mile radius of the navigation facility but not acceptable navigation signal coverage.

069. Prior to operating an airplane under IFR in controlled airspace, each static pressure system and each altimeter must have been tested, inspected, and found to meet regulatory requirements within the preceding

E03 1- 6 calendar months.
2- 12 calendar months.
3- 24 calendar months.
4- 36 calendar months.

070. What airplane inspections, checks, or tests are required to operate on an IFR flight <u>not</u> carrying persons for hire or instruction?

E05 1- 100-hour, altimeter systems test, and VOR accuracy check.
2- 100-hour, weight and balance test altimeter systems test.
3- Annual, weight and balance test, and altimeter systems test.
4- Annual, altimeter systems test, VOR accuracy check, and transponder test.

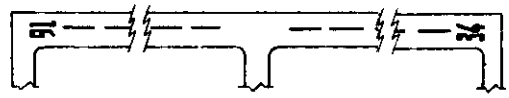



Figure 3

071. The numbers 16 and 34 on the approach ends of the runway in Fig. 3, indicate that the runway is oriented approximately

J02 1- 160°/340° magnetic.
2- 16°/34° true.
3- 16°/34° magnetic.
4- 160°/340° true.

072. Within how many months preceding an IFR airplane flight in controlled airspace must the static pressure system and each altimeter instrument be tested, inspected, and found to meet required standards?

E05 1- 12 calendar months.
2- 18 calendar months.
3- 24 calendar months.
4- 36 calendar months.

073. No person may operate an airplane in controlled airspace under IFR unless each static pressure system and each altimeter instrument has been tested, inspected, and found to comply with required standards, within the preceding

E05 1- 12 calendar months.
2- 18 calendar months.
3- 24 calendar months.
4- 36 calendar months.

074. The factors on which aircraft approach categories are based include which of these speeds?

I05 1- Stalling speed (Vso).
2- Stalling speed (Vs1) and maximum certificated gross weight.
3- A speed of 1.3 Vso at maximum gross landing weight.
4- Maneuvering speed (Va) and maximum certificated landing weight.

075. Aircraft approach category means a grouping of aircraft based on

I05 1- a speed of 1.3 Vso at maximum gross landing weight.
2- stalling speed (Vs1) and maximum certificated gross weight.
3- stalling speed (Vso) and maximum certificated gross landing weight.
4- maneuvering speed (Va) and maximum certificated landing weight.

076. What are the three parts into which "ILS" may be divided functionally?

J03 1- Azimuth information, DME information, and altitude information.
2- Azimuth information, altitude information, and runway information.
3- VORTAC information, altitude information, and ADF information.
4- Guidance information, Range information, and Visual information.

077. Consider ATC's use of the term "cruise" instead of "maintain" when assigning altitudes. Which of the following statements is correct?

J01 1- A "cruise" clearance includes approval to proceed to and make an approach at the destination airport without further clearance.
2- A "cruise" clearance includes approval to proceed to the destination airport, but the approach may not be started until further clearance from ATC.
3- Pilots may descend from and return to any altitude not exceeding the assigned altitude without further clearance from ATC.
4- Pilots may climb to, but not descend from, the assigned altitude at their own discretion.

078. When used by ATC, a "cruise 6,000" clearance would mean that the pilot may

J01 1- descend from and return to any altitude up to and including 6,000 feet MSL at the pilot's discretion without further approval by ATC.
2- select and maintain any en route altitude which does not exceed 6,000 feet MSL, but must obtain an approach clearance.
3- maintain cruising flight at 6,000 feet MSL, but must obtain a subsequent altitude assignment prior to descending.
4- maintain or descend from 6,000 feet MSL at the pilot's discretion, but after reporting leaving 6,000 feet may not return to the altitude without additional clearance.

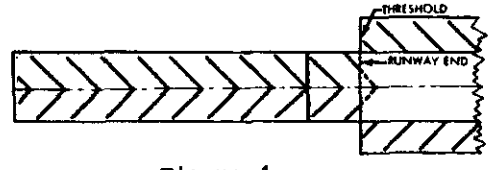



Figure 4

079. Refer to Fig. 4. The area to the left of the threshold is an area that

J02 1- is an "over-run" with sufficient strength for all aircraft operations.
2- is a "deceptive area" usable only for taxiing.
3- appears usable but which, due to the nature of its structure, is unusable.
4- is of sufficient strength for taxiing and takeoff but not for landing.

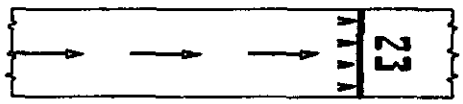



Figure 5


Figure 6

080. Figure 5 is an illustration of a basic runway with a displaced threshold. The arrows appear in the area of the runway that

J02 4- may be used only for taxiing.
2- is usable for taxiing, takeoff, and landing.
3- cannot be used for landing, but may be used for taxiing and takeoff.
4- is available for landing at the pilot's discretion.


081. If you wished to land 1,000 feet from the threshold of the runway illustrated above, you should plan to touch down at point

J02 1- "A."
2- "B."
3- "C."
3- "D."

082. Which of the following is not considered to be a basic component of an approach procedure?

J03 1- An approach lighting system for the ILS runway.
2- An off-course VOR facility used to establish a stepdown fix.
3- The DME portion of a VOR/DME approach procedure.
4- Operative runway lights during a night approach.

083. The visual glidepath of a 2-bar VASI provides safe obstruction clearance within plus or minus 10° of the extended runway centerline and to a distance of how many miles from the runway threshold?

J04 1- 4 nautical miles.
2- 6 nautical miles.
3- 8 nautical miles.
4- 10 nautical miles.

084. Which of the following is correct concerning Runway 20L shown in Fig. 6?

J02 1- This runway is 8,000 feet long with touchdown markings 500 feet apart.
2- This runway has Precision Instrument Runway markings.
3- This runway has Non-Precision Instrument Runway markings.
4- This runway is marked to aid only air carrier jet aircraft during low visibility approaches.

085. Regarding the "SDF," which of the following is a correct statement?

J03 1- The SDF course may not be aligned with the runway.
2- The SDF course will be more narrow than an LOC course.
3- The SDF system will have a 3° to 5° glide slope.
4- The SDF and ILS are exactly the same, except the SDF operates in the low frequency range.

086. Which statement is correct concerning "ILS" facilities?

J03 1- The glidepath angle is usually less than 2.5° above the horizontal.
2- Approach minimums for the ILS normally establish a DH with a HAT of 400 feet.
3- Marker beacons have a rated power of 5 watts and they transmit a continuous series of dashes.
4- The localizer normally is adjusted to provide a linear width of approximately 700 feet at the runway approach threshold.

087. Which statement is correct about the near and middle bars of a 3-bar VASI?

J04 1- They constitute a 2-bar VASI for using the lower glidepath.
2- They constitute a 2-bar VASI for using the upper glidepath.
3- They should both be red when the airplane is on the proper glidepath.
4- They should both be white when the airplane is on the proper glidepath.

088. Which substitution is appropriate during an ILS approach?

J03 1- LOC minimums should be substituted for ILS minimums whenever the glide slope becomes inoperative.
2- DME, when located at the localizer antenna site, should be substituted for either the outer or middle marker.
3- ADF bearings crossing either the outer or middle marker sites may be substituted for these markers.
4- A VOR radial crossing the outer marker site may be substituted for the outer marker.

089. Regarding inoperative components of an instrument approach procedure, which of the following is a correct statement?

J03 1- A compass locator or precision radar may be substituted for the ILS outer or midddle marker.
2- When the ILS glide slope is inoperative, the published circling minimums apply.
3- ADF or VOR bearings which cross either the outer or middle marker sites, may be substituted for these markers.
4- DME, when located at the localizer antenna site, should be substituted for the outer or middle marker.

090. The middle and far bars of a 3-bar VASI will

J04 1- constitute a 2-bar VASI for using the lower glidepath.
2- constitute a 2-bar VASI for using the upper glidepath.
3- both appear red to the pilot when on the upper glidepath.
4- both appear white to the pilot when on the upper glidepath.

091. Tricolor Visual Approach Indicators normally consist of

J04 1- a single unit, projecting a three color visual approach path.
2- two separate light units, each projecting three different colors to identify the approach path.
3- three separate light units, each projecting different color approach path.
4- three separate light projecting units of very high candle power with a daytime range of approximately 5 miles.

092. The localizer transmitter of the "ILS" operates within which of the following frequency ranges?

J03 1- 106.50 MHz to 112.10 MHz.
2- 108.10 MHz to 111.95 MHz.
3- 109.50 MHz to 117.90 MHz.
4- 110.10 MHz to 118.10 MHz.

093. Assume that RVR minimums for takeoff or landing are published in an instrument approach procedure, but RVR is inoperative and cannot be reported for the runway at the time. Which of the following would be correct?

J03 1- RVR minimums which are specified in the procedure should be converted and applied as ground visibility.
2- RVR minimums may be disregarded, providing the runway has an operative HIRL system.
3- RVR minimums may be disregarded, providing all other components of the ILS system are operative.
4- RVR minimums may be disregarded, providing the pilot does not descend below the highest MDA listed for that approach procedure.

094. When on the proper glidepath of a 2-bar VASI, the pilot will see the near bar as

J04 1- red and the far bar as red.
2- white and the far bar as red.
3- red and the far bar as white.
4- white and the far bar as white.

095. ATC control of an approved instrument approach to an airport underlying a transition area, but without a control tower, would continue until the airplane is

J04 1- at the missed approach point.
2- aligned with the landing runway.
3- below 700 feet above the surface.
4- below 1,200 feet above the surface.

096. To avoid excessive vectoring, ATC may request pilots to adjust their speed. When complying with such a request the pilot is expected to maintain that speed within

J09 1- 5 knots, based on groundspeed.
2- 10 knots, based on indicated speed.
3- 5 knots, based on calibrated speed.
4- 10 knots, based on true speed.

097. If an approach is being made to a runway that has an operating 3-bar VASI and all the VASI Lights appear red as the airplane reaches the MDA, the pilot should

J04 1- continue at the same rate of descent if the runway is in sight.
2- level off momentarily to intercept the proper approach path.
3- increase the descent rate to intercept the proper approach path.
4- start a climb to reach the proper glide path.

098. During ATIS broadcasts, the absence of a sky condition/ceiling indicates a ceiling condition of

J08 1- 5,000 feet or greater.
2- 6,000 feet or greater.
3- 8,000 feet or greater.
4- 10,000 feet or greater.

099. In an ATIS broadcast, the absence of a visibility condition may indicate a visibility of

J08 1- 5 miles or more.
2- 6 miles or more.
3- 8 miles or more.
4- 10 miles or more.

100. During the conduct of a "Contact Approach" procedure, which of the following is correct?

J09 1- The pilot assumes the responsibility for obstruction clearance.
2- Heading and altitude assignments will continue until the pilot reports visual contact with the runway.
3- ATC will issue altitude assignments to assure obstruction clearance.
4- Radar service will automatically terminate when the contact approach clearance is issued.

101. In the event of a communications failure during IFR flight, what transponder codes should the pilot squawk?

J09 1- 7600 for 1 minute then 7700 for 15 minutes.
2- 7600 for 15 minutes then 7700 for 1 minute.
3- 7700 for 1 minute then 7600 for 15 minutes.
4- 7700 for 15 minutes then 7600 for 1 minute.

102. ATC will not issue a clearance to an IFR flight specifying that climb, descent, or any portion of the flight be conducted in VFR conditions, unless

J09 1- the pilot requests a VFR restriction.
2- the pilot reports visual contact with another aircraft.
3- the VFR restriction will expedite traffic flow out of the terminal area.
4- for operations within a Terminal Control Area when the IFR pilot reports VFR conditions.

103. Suppose that after receiving an expected approach clearance time (EAC), the pilot experiences two-way radio communications failure while holding at a fix other than the approach fix. What procedure should be followed?

J09 1- Depart the holding fix at the EAC time, and complete the approach.
2- Hold until the EAC time, then proceed to the approach fix and complete the approach.
3- Depart the holding fix at the flight planned ETA (as amended with ATC); proceed to the approach fix and complete the approach.
4- Depart the holding fix to arrive at the approach fix as close as possible to the EAC time, and complete the approach.

104. Minimums for an ILS approach with all components operative, normally establish a visibility requirement of

J09 1- 1/4 mile.
2- 1/2 mile.
3- 3/4 mile.
4- 1 mile.

105. Which of the following is a true statement about the addition of a "VFR restriction"?

J09 1- It authorizes the pilot to deviate from the altitude assignment received in the last ATC clearance.
2- It authorizes the pilot to deviate from the route of flight specified in the IFR clearance.
3- It authorizes the pilot to deviate from any portion of the last ATC clearance.
4- It does not authorize the pilot to deviate from any portion of the ATC clearance.

106. If the aircraft is equipped with a radar beacon transponder and two-way radio communication failure occurs, the pilot should adjust the transponder to reply on

J09 1- 7500 for 1 minute, then 7700 for the remainder of the flight.
2- 7600 for 2 minutes, then code 7700 for 10 minutes and continue to repeat this process for the remainder of the flight.
3- 7700 for 1 minute, then 7600 for 15 minutes or the remainder of the flight whichever occurs first.
4- 7700 and activate the Ident feature every 10 minutes for the remainder of the flight.

107. Assume that while operating on an IFR flight plan a VFR restriction is assigned. The pilot should expect that ATC will

J09 1- not apply IFR separation during the "VFR restriction" portion of the flight.
2- cancel the IFR flight plan, thus if IFR conditions are encountered a new IFR flight plan must be filed.
3- continue to apply IFR separation until the pilot requests the IFR flight plan be cancelled.
4- not issue radar traffic advisories during the "VFR restriction" portion of the flight.

108. ATC controllers may authorize a "Contact Approach" provided the

J09 1- flight visibility is reported to be more than 3 miles.
2- ceiling and visibility at the destination airport is more than 1,000 feet and 5 miles.
3- contact approach will be made to an airport having a standard or special approach procedure.
4- controller can establish and maintain radar contact and issue the pilot appropriate heading and altitude assignments.

109. Minimums for an ILS approach with all components operative, normally establish a DH with a HAT of

J09 1- 200 feet.
2- 400 feet.
3- 600 feet.
4- 800 feet.

110. Which of the following statements is correct regarding a "Contact Approach"?

J09 1- During a Contact Approach, ATC will provide altitude assignments which assure obstruction clearance.
2- A Contact Approach is an approach procedure that may be used (with prior clearance from ATC) in lieu of conducting a standard or special instrument approach procedure to an airport.
3- A Contact Approach is primarily intended for use by a pilot on an IFR flight clearance to operate to an airport not having an authorized instrument approach procedure.
4- A Contact Approach is intended for pilots who wish to conduct an instrument approach to one airport and then, when "in the clear" to divert to another airport for landing.

111. Which of the following statements is correct concerning a "Contact Approach"?

J09 1- The ceiling and visibility must be at least 1,000 feet and 5 miles.
2- The pilot must be able to operate clear of clouds and have at least 1 mile of flight visibility.
3- ATC may instruct arriving aircraft to expect vectors for a "Contact Approach" any time the ceiling and the visibility is more than 1,000 feet and 3 miles.
4- ATC will not approve a pilot's request for a "Contact Approach" unless the reported ground visibility at the destination is at least 2 miles.

112. Suppose during two-way communications failure, it is necessary to hold at the radio fix to be used for the approach at the destination airport. Descent to the initial approach altitude shall be accomplished

J09 1- any time prior to reaching the radio fix to be used for the approach.
2- only upon being established in the procedure time.
3- in the holding pattern, if one is depicted on the approach chart, or if no holding pattern is depicted, on the side on which the procedure turn is prescribed.
4- immediately after squawking 7700 on the radar beacon transponder and prior to reaching the radio fix to be used for the approach.

113. Which of the following conditions is required before "timed approaches from a holding fix" may be conducted?

J09 1- More than one missed approach procedure must be available.
2- If more than one missed approach procedure is available, only one may require a course reversal.
3- If more than one missed approach procedure is available, none may require a course reversal.
4- Direct communication between the pilot and the tower must be established prior to beginning the approach.

114. If only one missed approach procedure is available, which of the following conditions is required when conducting "timed approaches from a holding fix"?

J09 1- The pilot must execute a procedure turn prior to departing the holding fix.
2- The pilot must contact the airport control tower prior to departing the holding fix inbound.
3- The reported ceiling and visibility minimums must be equal to or greater than the highest prescribed circling minimums for the instrument approach procedure.
4- The reported ceiling and visibility minimums must be equal to or greater than the highest prescribed straight-in MDA minimums for the instrument approach procedure.

115. ATC should be advised any time a pilot is unable to climb or descend at a rate of at least

J09 1- 200 feet/minute.
2- 250 feet/minute.
3- 500 feet/minute.
4- 1,000 feet/minute.

116. Regarding Standard Instrument Departures (SIDs), which statement is correct?

J09 1- SID clearances will not be issued unless requested by the pilot.
2- The pilot in command must accept a SID when issued by ATC.
3- If a SID is accepted, the pilot must possess at least a textual description.
4- ATC will issue a SID whenever it is necessary to amend a departure clearance.

117. Prior to conducting "timed approaches from a holding fix," which one of the following is required?

J09 1- The airport where the approach is to be conducted must have a control tower in operation.
2- The pilot must execute a procedure turn when cleared for the approach.
3- The pilot must have established two-way communications with the tower before departing the holding fix.
4- The time required to fly from the primary facility to the field boundary must be determined by a reliable means.

118. When making a "timed approach" from a holding fix at the outer marker, the pilot should adjust the

J09 1- procedure turn to arrive at the final approach fix at the assigned time.
2- holding pattern to start the procedure turn at the assigned time.
3- airspeed at the final approach fix in order to arrive at the missed approach point at the assigned time.
4- holding pattern to leave the final approach fix inbound at the assigned time.

119. When may a pilot file a composite flight plan?

J09 1- When requested or advised by ATC.
2- Any time a portion of the flight will be VFR.
3- Any time a landing is planned at an intermediate airport.
4- Only if the entire flight is in controlled airspace.

120. Under which of the following circumstances will ATC issue a VFR restriction to an IFR flight?

J09 1- When the pilot requests it.
2- Whenever a traffic conflict might otherwise occur.
3- Whenever the pilot reports the loss of any navigational aid.
4- When it is necessary to provide separation between IFR and special VFR traffic.

121. Which statement is true regarding a direct IFR flight off airways but within controlled airspace?

J09 1- Altitudes flown must be based on the true heading of the route.
2- All fixes used to define the route of flight must be within a distance of 50 nautical miles from each other.
3- Any fix used to define the route of flight automatically becomes a compulsory reporting point.
4- Since ATC has no control authority over off-airway IFR traffic, separation from other traffic is the sole responsibility of the pilot in command.

122. To comply with ATC instructions for altitude changes of more than 1,000 feet, what rate of climb or descent should be used?

J09 1- 1,000 feet per minute until reaching the assigned altitude.
2- 1,000 feet per minute during climb and 500 feet per minute during descents until reaching the assigned altitude.
3- As rapidly as practicable to 500 feet above/below the assigned altitude, and then at 500 feet per minute until the assigned altitude is reached.
4- As rapidly as practicable to 1,000-feet above/below the assigned altitude, and then at 500 feet per minute until reaching the assigned altitude.

123. Which rules apply to the pilot in command when operating "VFR conditions-on-top"?

J16 1- VFR only.
2- IFR only.
3- VFR and IFR.
4- VFR when "in the clear" and IFR when "in the clouds."

124. When can a "VFR conditions-on-top" clearance be assigned by ATC?

J16 1- Any time suitable conditions exist and ATC wishes to expedite traffic flow.
2- When VFR conditions exist, but there is a layer of clouds below the MEA.
3- Any time IFR conditions exist at the departure point, but not at the destination.
4- Upon request of the pilot when conditions are indicated to be suitable.

125. Regarding Standard Instrument Departures (SIDs), which statement is correct?

J09 1- SID clearances are issued only if requested by the pilot.
2- The pilot in command has no choice other than to accept a SID when issued by ATC.
3- SIDs are established at certain airports primarily to simplify clearance delivery procedures.
4- SIDs are used by ATC whenever it is necessary to amend a departure clearance.

126. Concerning ATC clearance for a "visual approach," which statement is correct?

J09 1- Clearance for a "visual approach" is an IFR authorization and will automatically cancel an IFR flight plan.
2- Clearance for a "visual approach" is an IFR authorization and does not alter IFR flight plan cancellation responsibility.
3- ATC will authorize a "visual approach" clearance any time the pilot reports the flight visibility to be greater than 1 mile.
4- ATC will not authorize a "visual approach" to one runway while other aircraft are conducting IFR or VFR approaches to another runway.

127. During a NO-GYRO approach and prior to being handed off to the final approach controller, the pilot should make all turns

J09 1- any rate not exceeding a 30° bank.
2- based upon groundspeed of the airplane.
3- standard rate unless otherwise advised.
4- one-half standard rate unless otherwise advised.

128. If a pilot elects to proceed to the selected alternate, the landing minimums used at that airport should be the

S11 1- alternate minimums shown on the approach chart.
2- standard alternate minimums for nonprecision approaches.
3- minimums specified for the approach procedure selected.
4- minimums shown for that airport in a separate listing of "IFR Alternate Minimums."

129. Which statement is correct regarding the operation of an airborne radar transponder?

J09 1- If ATC fails to specify a code in an IFR clearance, the pilot should squawk Code 1400.
2- Whenever changes to the code are received from ATC, the "ident" feature should be activated.
3- Unless instructed otherwise by ATC, the transponder should be adjusted to reply on mode C, with altitude reporting capability activated.
4- Pilots should squawk Code 3300 whenever operating within a restricted area, unless otherwise instructed by ATC.

130. After being handed off to the final approach controller during a NO-GYRO surveillance or precision approach, the pilot should make all turns

J09 1- standard rate.
2- one-half standard rate.
3- any rate not exceeding 30° bank.
4- based upon the groundspeed of the aircraft.

131. For IFR operations off established airways using En Route Low Altitude Charts, and below 18,000 feet MSL, the distance between navigational aids should not be more than

J09 1- 80 nautical miles.
2- 100 nautical miles.
3- 200 nautical miles.
4- 260 nautical miles.

132. While being vectored, if crossing the ILS final approach course becomes imminent and an approach clearance has not been issued, what action should be taken by the pilot?

J10 1- Maintain the last assigned heading and query ATC.
2- Turn inbound and hold at the intersection of the final approach course and the outer marker.
3- Turn outbound on the final approach course, execute a procedure turn, and inform ATC.
4- Turn inbound and execute the missed approach procedure at the outer marker if approach clearance has not been received.

133. For IFR operations off established airways using (H) type VOR, VORTAC, or TACAN navigational facilities between 14,500 and 17,999 feet MSL, the distance between such facilities should not exceed

J09 1- 80 nautical miles.
2- 100 nautical miles.
3- 150 nautical miles.
4- 200 nautical miles.

134. ATC should be advised whenever the average true airspeed between reporting points is expected to vary from that given in the flight plan by 10 knots or plus or minus

J16 1- 2 percent.
2- 3 percent.
3- 4 percent.
4- 5 percent.

135. The Low-Level Prognostic Chart depicts weather conditions

K03 1- as they existed at the time the chart was prepared.
2- that are forecast to exist 6 hours after the chart was prepared.
3- that are forecast to exist at the valid time shown on the chart.
4- that existed at the time shown on the chart which is about 3 hours before the chart is received.

136. Weather radar observations are of special interest to IFR pilots, because they primarily reveal

K07 1- icing conditions.
2- depth and spread of clouds.
3- severe weather.
4- large areas of low ceiling and fog.

137. Which statement is true concerning this Radar Weather Report for JAN?

JAN 1935 SPL LN 1Ø TRWX/NC 86/4Ø 164/6Ø 119/115 12W C243Ø MT 44Ø AT 159/65 D1Ø.

K07 1- The visibility is 10 miles in intense rain showers.
2- The line of cells are moving from 159° with winds reported up to 65 knots.
3- There are three cells with tops at 11,500, 40,000, and 60,000 feet.
4- The maximum tops are 44,000 feet located 65 NM southeast of the station.

AREA FORECAST

FA 121240
DFW FA 121240
13Z SAT-07Z SUN
OTLK 07Z-19Z SUN

NMEX OKLA TEX AND CSTL WTRS...

HGTS ASL UNLESS NOTED...

SYNS... LARGE INTNS LOW PRES AREA CNTRD OVR IA AT 13Z MOVG NEWD. CDFNT ALG JLN TUL FSI PVW LVS ALS LN AT 13Z MOVG SWD 25-30 KTS.

SIG CLDS AND WX...
CSTL WTRS... GENLY SCT CLDS 20-30 VRBL HI CI CLDS ABV. OTLK...MVFR PSBL BRF LIFR TRW.

SE OF DRT BWD MLC FSM LN EXCP FOR THE CSTL WTRS... LN TSTMS ALG AUS DRT LN AT 13Z MOVG SEWD ABT 15 KTS AND DCRG BY 15Z. TSTMS REDVLPG OVR SRN AND ERN OK BY 18Z. CIGS ARND 10 VSBYS BLO 3 MIS GUSTY SFC WNDS AND HAIL WITH CB TOPS TO 500 IN HVYR TSTMS. OUTSIDE TSTMS VRBL CONDS GENLY CIGS 8-18 BUT LCLY CIGS AND VSBYS ZERO ZERO IN FOG AT 13Z. FOG DSIPTG CIGS IPVG TO ABV 20 BY 17Z. CLRG AFT FROPA. OTLK... MOSTLY VFR.

N OF CDFNT... VRBL GENLY BKN CLDS CIGS 20-30. SFC WNDS OCNL 3625G45 WITH SOME DUST AND BLWG DUST VSBYS OCNLY LWRG 2-6 MIS MAINLY OVR NWRN TEX AND WRN OKLA. SNW OCNL OBSCD MTNS OVR NMEX. WNDS DCRG AFT DARK. COLDS DCRG BY 07Z. OTLK... MOSTLY VFR.

ELSW... GENLY CLR EXCP IN MTN SECS OF NMEX OCNL 100-150 SCT TO OVC WITH SNW OCNL OBSCG HIR MTNS TIL 00Z. OTLK... MOSTLY VFR.

ICG... RISK ISOLD SVR ICGIP ABV FRZG LVL. FRZG LVL SFC NRN OKLA NRN NMEX SLPG TO 140 OVR CSTL WTRS.

# FIG-7

138. Which of the following does a prognostic chart provide?

K03 1- Representation of a past weather trend.
2- Conditions forecast to exist at a specific time shown on the chart.
3- Conditions existing at the time of the observation.
4- Interpretation of weather condtions for geographical areas between reporting stations.

139. Refer to Figure 7 above. What cloud condition is expected in the coastal waters area?

K08 1- Ceilings from 2,000 to 3,000 feet.
2- Low clouds, IFR conditions, and thunderstorms.
3- Stratus clouds with bases at 2,000 feet MSL and tops at 3,000 feet MSL.
4- Generally scattered clouds at 2,000 to 3,000 feet MSL with some high cirrus clouds.

140. Refer to Figure 7 above. When can you expect to encounter severe icing?

K07 1- Any time above the freezing level.
2- Any time in the clouds.
3- Above 50,000 feet in the clouds.
4- Whenever above the freezing level and in precipitation.

141. Refer to Figure 7 above. This area forecast is valid for which time period?

K08 1- 1240Z Saturday to 0700Z Sunday.
2- 1240Z Saturday to 1900Z Sunday.
3- 1300Z Saturday to 0700Z Sunday.
4- 1300Z Saturday to 1900Z Sunday.

142. Refer to Figure 7 above. At what altitude is the freezing level forecast for northern Oklahoma?

K08 1- Surface.
2- 2,000 feet.
3- 10,000 feet.
4- 14,000 feet.

OKC SA 1Ø53 CLR 15 1Ø6/77/63/1112G18/ØØØ
AMA SA 1Ø53 15Ø SCT 3Ø 181/62/42/13Ø4/Ø15
ICT SA 1Ø53 7 SCT 25Ø SCT 6HK 129/6Ø/59/25Ø4/991→ LAX↘ 6/38
TUL SP 1Ø53 -X M7 OVC 11/2R+F 99Ø/63/61/32Ø5/98Ø/RF2 RB12
MKC SP 1Ø53 W5 X 1/2F 18Ø/68/64/18Ø4/ØØ6/RO4RVR22V3Ø TWR VSBY 1/4

# FIG-9

159. Refer to Figure 9 above, and determine the sky condition and ceiling, if any, for TUL.

K12
1- Overcast 1,100 feet.
2- Sky obscured; ceiling not measurable.
3- Measured ceiling 700 feet, and overcast at 1,100 feet.
4- Sky partially obscured; measured ceiling 700 feet overcast.

160. Refer to Figure 9 above. For the purpose of determining if a landing may be made on RWY 4R after a successful instrument approach, what is the reported visibility at MKC?

K12
1- 1/4 mile.
2- 1/2 mile.
3- 5 miles.
4- 2,200 variable to 3,000 feet RVR.

161. Refer to Figure 9 above. The wind conditions at MKC are

K12
1- 040° at 18 knots.
2- 040° at 22 to 30 knots.
3- 180° at 4 knots.
4- 360° at 6 knots.

162. Refer to Figure 9 above. What is the sky condition and ceiling at ICT?

K12
1- Ceiling 600 feet; variable scattered 700 to 25,000 feet.
2- 700 feet scattered; 25,000 feet scattered; no ceiling.
3- 700 feet scattered; 2,500 feet scattered and no ceiling.
4- 7,000 feet scattered; 25,000 feet scattered.

163. Refer to Figure 9 above. The reported ceiling at MKC is

K12
1- indefinite, 500 feet.
2- 500 feet overcast.
3- 500 feet broken.
4- 5,000 feet sky obscured.

164. Refer to Figure 9 above and determine the surface wind conditions at AMA.

K12
1- 010° at 5 knots.
2- 062° at 42 knots.
3- 130° at 4 knots.
4- 180° at 10 knots.

165. Refer to Figure 9 above. What is the surface wind condition at OKC?

K12
1- Calm.
2- 100° at 6 knots.
3- 070° at 7 knots.
4- 110° at 12 knots.

166. Refer to Figure 9 above. The visibility, weather, and obstructions to vision reported at ICT are

K12
1- visibility 6 miles, haze and smoke.
2- visibility 6 to 38 miles; scattered patches of haze and smoke.
3- visibility 6 to 38 miles; snow crystals in thunderstorms.
4- unlimited visibility; no obstructions to vision.

167. Refer to Figure 9 above. What are the visibility, weather, and obstructions to vision at TUL?

K12
1- Visibility 1 1/2 miles, rain and heavy fog.
2- Visibility 1 1/2 miles, heavy rain and fog.
3- Visibility 11 miles, except when rain and fog reduce it to 2 miles.
4- Visibility 11 miles, occasionally 2 miles, with rain and fog.

168. Refer to Figure 9 above. Which of the reporting stations is reporting the highest sea level pressure?

K12
2- AMA.
3- ICT.
4- TUL.
1- OKC.

169. In a Terminal Forecast 6-hour categorical outlook, the word "wind" means that the wind during that period is forecast to be

K09 1- 10 to 15 knots.
2- 15 to 20 knots.
3- less than 25 knots.
4- 25 knots or more.

170. On a Terminal Forecast, what does the absence of a visibility entry mean concerning the visibility at the surface?

K09 1- Visibility is at least 3 miles.
2- Visibility exceeds 6 miles.
3- Visibility exceeds 15 miles in all directions.
4- Visibility is at least 1 mile above the minimum visibility requirement for an approach to the primary instrument runway.

171. If, during an IFR flight you encounter wet snow, what would that indicate regarding the temperature in that area?

K19 1- The temperature is above freezing at your altitude.
2- The temperature is above freezing at higher altitudes.
3- You are flying from a warm air mass into a cold air mass.
4- You are in an "inversion" with colder air below.

172. Which of the following conditions should a pilot anticipate?

K20 1- Lifting or clearing of low clouds and fog when temperature/dewpoint spread is increasing.
2- Less cloudiness, fog, and precipitation over higher terrain when moist winds are blowing uphill.
3- Less cloudiness, fog, and precipitation when wind blows from water than when it blows from land.
4- Frost on an overcast night, when temperature/dewpoint spread is 8° F. or more, is increasing and dewpoint is warmer than 32° F.

173. Which of the following is a characteristic typical of a stable air mass?

K22 1- Turbulent air.
2- Cumuliform clouds.
3- Continuous precipitation.
4- Showery precipitation.

174. Consider this Pilot Weather Report (PIREP) and select the correct interpretation.

UA/OV MRB FLØ3Ø/SK INTMTLY BL/TB MDT/RM R TURBC INCRS.

K13 1- Ceiling 3,000; intermittently below moderate thundershowers; turbulence increasing westward.
2- At 3,000 feet, intermittently between layers; thunderstorms moderate; rain and turbulence increasing with wind.
3- At 3,000 feet; intermittently between layers; moderate turbulence; moderate rain; rain and turbulence increasing.
4- Flight level 30,000, intermittently below clouds; moderate rain, turbulence increasing with the wind.

175. The presence of standing lenticular altocumulus clouds is a good indication of

K17 1- heavy rain.
2- heavy icing conditions.
3- an approaching storm.
4- very strong turbulence near those clouds.

176. When arriving at or departing from a terminal reporting precipitation of light or greater intensity, the pilot can expect the thickness of the clouds to be

K19 1- 1,000 - 2,000 feet.
2- 2,000 - 3,000 feet.
3- 3,000 - 4,000 feet.
4- 4,000 feet or more.

177. Suppose during an IFR flight at 8,000 feet you encounter ice pellets. What does this indicate?

K19 1- The formation of low clouds or fog.
2- Freezing rain at higher altitude.
3- You are approaching an area of thunderstorms.
4- You will encounter hail if you continue.

178. Which of the following is a characteristic typical of a stable air mass?

K22 1- Showery precipitation.
2- Cumuliform clouds.
3- Fair to poor visibility in haze and smoke.
4- Good visibility, except in blowing obstructions.

143. Refer to Figure 7. Consider this area forecast and determine the outlook for the area north of the cold front.

K08 1- Low visibility due to blowing dust.
2- Variable, generally broken clouds.
3- Mostly VFR.
4- Clear of clouds after the frontal passage.

144. What preflight planning information is available to a pilot using a constant pressure chart?

K05 1- Levels of widespread cloud coverage.
2- Winds and temperatures aloft.
3- Frontal systems and obstructions to vision aloft.
4- Clear air turbulence and icing conditions.

145. To make the most effective use of Radar Summary Charts during preflight planning, the pilot should utilize the chart

K07 1- with the Weather Depiction Chart to get a three-dimensional picture of clouds and precipitation.
2- as the only source of information regarding storms and hazardous conditions existing between reporting stations.
3- as the best source of information for ceilings, cloud tops, and cloud coverage between reporting stations.
4- to determine more accurate measurements of freezing levels, cloud cover, and wind conditions between reporting stations.

146. Which statement is true regarding this Pilot Weather Report (PIREP)?

UA/OV 20S OKC 1640 FL050/TP BE58/IC MDT RIME ICE.

K13 1- Snow encountered at 2,000 feet over OKC at 1640Z; a Beech 58 encountered rime ice at 5,000 feet.
2- 20 minutes after the hour, snow began at OKC, wind 160° at 40 knots; a Beech 58 reported moderate rime ice at 5,000 feet.
3- 20 minutes after the hour, south of OKC, wind was reported from 160° at 40 knots; moderate rime icing began 20 minutes after the hour at 5,000 feet.
4- 20 nautical miles south of OKC at 1640Z, a pilot flying at 5,000 feet in a Beech 58 reported moderate rime ice.

147. Which statement is true concerning this Radar Weather Report for OKC?

OKC 1934 LN 8TRW++/+ 86/40 164/60 199/115 15W 2425 MT 570 AT 159/65 2 INCH HAIL RPRTD THIS ECHO.

K07 1- The visibility is 8 miles in rain showers.
2- The line of cells is moving 080° with winds reported up to 40 knots.
3- There are three cells with tops at 11,500, 40,000, and 60,000 feet.
4- The maximum top of the cells is 57,000 feet located 65 NM south-southeast of the station.

148. What information is provided by the Radar Summary Chart that is not shown on other weather charts?

K07 1- Outlines turbulence between reporting stations.
2- Reveals ceilings and precipitation between reporting stations.
3- Depicts areas of cloud cover and icing levels within the clouds.
4- Depicts lines and cells of hazardous thunderstorms.

149. Which statement is true concerning this Radar Weather Report for MAF?

MAF 113/ AREA 2 S 27/80 90/125 196/50 268/100 2410 MT U100.

K07 1- The visibility is 2 miles in snow.
2- The movement is from 240° at 10 knots.
3- There are three cells with tops at 8,000, 12,500, and 50,000 feet.
4- The maximum tops are 50,000 feet located 2 miles south of the station.

150. How is the stability of an air mass affected by moisture and vertical movement?

K22 1- Sinking of an air mass and removal of water vapor from the lower layers tend to increase stability.
2- Sinking of an air mass and addition of water vapor to the lower layers tend to decrease stability.
3- Lifting of an air mass and addition of water vapor to the lower layers tend to increase stability.
4- Lifting of an air mass and removal of water vapor from the lower layers tend to decrease stability.

# TERMINAL FORECASTS

OKC FT 261Ø1Ø C5 X 1/2S-BS 1525G3Ø OCNL CØ X ØS+BS.
16Z C4Ø BKN 3BS BRF SW-. 22Z 5Ø SCT 3315.
ØØZ CLR. Ø4Z VFR WIND..

AMA FT RTD 261615 162ØZ 1ØØSCT 25Ø SCT 181Ø.
18Z 5Ø SCT 1ØØ SCT 1913 CHC C3Ø BKN 3 TRW AFT
2Ø. Ø3Z 1ØØ SCT C25Ø BKN. Ø9Z VFR..

ICT FT AMD 1 261410 1425Z C8 OVC 4F OVC V
BKN. 15Z 2Ø SCT 25Ø-BKN. 19Z 4Ø SCT 12Ø
SCT CHC C3Ø BKN 3TRW. Ø4Z MVFR CIG F..

# FIG - 8

151. Refer to Figure 8 above. What is the latest time the ICT FT AMD 1 is valid?

K09 1- 1000Z on the 27th day.
2- 1410Z on the 26th day.
3- 1425Z on the 26th day.
4- 1425Z on the 27th day.

152. Refer to Figure 8 above. Which of the following conditions is forecast to accompany the thundershowers at AMA?

K09 1- 500 to 1,000 feet scattered with a chance of a 300-foot broken ceiling.
2- 5,000 feet scattered; 10,000 feet scattered, and the wind from 190° at 13 knots.
3- Ceiling 3,000 feet broken; 3 miles visibility.
4- 10,000 feet scattered; ceiling 25,000 feet broken.

153. Refer to Figure 8 above. Which of the following conditions is expected to cause low visibility in OKC?

K09 1- Blowing snow.
2- Gusty winds and a squall line.
3- Gusty winds and blowing sand.
4- Light smoke and blowing sand.

154. Refer to Figure 8 above. Consider the 6-hour categorical outlook portion of the OKC FT. What conditions are forecast for that period?

K09 1- Clear.
2- VFR conditions; wind 25 knots or more.
3- Clouds 3,000 scattered; wind 330° at 15 knots.
4- 3,000-foot ceilings; 3 miles visibility; wind 330° at 15 knots.

155. Refer to Figure 8 above. Consider the 6-hour categorical outlook of the amended terminal forecast for ICT. What conditions are forecast?

K09 1- 4,000 scattered; 12,000 scattered.
2- Marginal VFR conditions with low ceilings and fog.
3- Chance of ceiling 3,000 broken with 3 miles visibility in thundershowers.
4- 2,000 scattered, 25,000 thin broken, and after 1900Z 4,000 scattered, 12,000 scattered with a chance of ceiling 3,000 broken, 3 miles visibility in thundershowers.

156. Refer to Figure 8 above. Determine the latest valid time for the OKC FT.

K09 1- 0400Z on the 26th day.
2- 0400Z on the 27th day.
3- 1000Z on the 26th day.
4- 1000Z on the 27th day.

157. Refer to Figure 8 above. Determine the lowest ceiling forecast for OKC during the period from 1000Z to 1600Z on the 26th.

K09 1- Zero.
2- 100 feet.
3- 500 feet.
4- 1,000 feet.

158. Refer to Figure 8 above. If you intend to use OKC as an alternate for your IFR flight, the ETA at OKC can be no earlier than what time?

K09 1- 1600Z.
2- 1800Z.
3- 2200Z.
4- 0000Z.

PIREP

UA/OV MRB-PIT 16ØØ FLØ3Ø/TP BE55/SK ØØ4 BKN Ø12/Ø22 BKN-OVC/TA Ø1/IC LGT-MDT RIME Ø35-Ø6Ø/RM WIND COMP HEAD Ø2Ø MH31Ø TAS 18Ø.

**FIG - 10**

179. Refer to the PIREP above. What is the reported cloud condition?

K12
1- 400 feet broken, tops 1,200 feet; second layer base 2,200 feet broken variable overcast.
2- Scattered 400 feet; second layer broken, 1,200 feet; third layer 2,200 feet broken variable overcast.
3- Sky obscured; 400 feet broken with tops 1,200 to 2,200 feet broken variable to overcast.
4- Broken 12,000 to 22,000 variable broken-overcast.

180. Refer to Figure 10 above. Where did the pilot encounter icing conditions?

K12
1- Over MRB VOR at 8,000 feet.
2- Over MRB VOR from 3,500 to 6,000 feet.
3- On a flight from MRB to PIT at 3,500 to 6,000 feet.
4- On a flight from MRB to PIT at 8,000 feet.

181. Which one of the following statements is correct concerning condensation of water vapor?

K21
1- Fog to the lee of the lake when the air is warm and the lake is cold.
2- Clouds to decrease when the temperature/dewpoint spread decreases.
3- Clouds to increase when the temperature/dewpoint spread increases.
4- Showers to the lee of a lake when the air is warm and the lake is cold.

182. Which statement is true regarding airplane structural icing?

K25
1- The most severe icing occurs with temperatures between 0° and -10° F.
2- Clear ice has a very rough and irregular shape, is very brittle and more easily removed than rime ice.
3- Clear ice is usually the result of large supercooled water droplets that freeze slowly upon contact.
4- Rime ice is a glossy, or translucent ice formed by the relatively slow freezing of large supercooled water droplets.

183. Regarding condensation or sublimation of water vapor, a pilot may anticipate which of the following?

K21
1- Fog when temperature/dewpoint spread is 5° F. or less and decreasing.
2- Lifting or clearing of low clouds and fog when temperature/dewpoint spread is decreasing.
3- Frost on an overcast night when temperature/dewpoint spread is 8° F. or more is increasing, and dewpoint is warmer than 32° F.
4- Less cloudiness, fog, and precipitation, when wind blows from water than when it blows from land.

184. A stable air mass is most likely to have which of the following characteristics?

K22
1- Showery precipitation.
2- Turbulent air.
3- Smooth air.
4- Cumuliform clouds.

185. An unstable air mass is most likely to have which of the following characteristics?

K22
1- Stratiform clouds and fog.
2- Turbulent air.
3- Continuous precipitation.
4- Fair to poor visibility in haze and smoke.

186. Concerning condensation of water vapor, which one of the following statements is true?

K22
1- Expect showers to the lee of a lake when the air is cold and the lake is warm.
2- Expect decreasing cloudiness when the temperature/dewpoint spread is decreasing.
3- Expect increasing cloudiness when the temperature/dewpoint spread is increasing.
4- Expect more fog and precipitation when the wind blows from land than when it blows from water.

187. Which of the following is a characteristic typical of an unstable air mass?

K22
1- Smooth air.
2- Stratiform clouds.
3- Showery precipitation.
4- Continuous precipitation.

188. Which of the following is a characteristic typical of an unstable air mass?

K22 1- Continuous precipitation.
2- Stratiform clouds and fog.
3- Good visibility, except in blowing obstructions to vision.
4- Fair to poor visibility in haze and smoke.

189. Stability of an air mass determines its typical weather characteristics. Which of the following is typical of a stable air mass?

K22 1- Turbulent air.
2- Stratiform clouds and fog.
3- Cumuliform clouds.
4- Showery precipitation.

190. Which of the following would be an indication of an unstable air mass?

K22 1- An inversion where temperature increases with altitude.
2- A cold and dry air mass near the surface.
3- A rapidly decreasing temperature aloft, approaching 3° C. per 1,000 feet of altitude.
4- A temperature which remains unchanged or decreases only slightly with altitude.

191. Which one of the following weather conditions should be expected when flying across a front?

K23 1- The presence of clouds, either ahead of or behind the front.
2- A small precipitation area if the frontal surface is shallow.
3- An abrupt and sizable temperature change, especially at high altitudes.
4- A change in wind direction or speed, or both.

192. Which statement about "structural icing" is true?

K25 1- Rime icing is more difficult to dislodge than clear icing.
2- Ice accumulation increases with a decrease in airspeed.
3- Structural icing increases fuel consumption.
4- Clear ice is more often encountered in stratiform clouds than in cumuliform clouds.

193. If the wind at 5,000 feet AGL is southwesterly, while directly below the surface winds are southerly, the difference in direction is caused by

K22 1- stronger coriolis force at the surface.
2- friction created by the wind flowing over the surface.
3- the influence of pressure systems at the lower altitudes.
4- a stronger pressure gradient at higher altitudes.

194. Stability of an air mass determines its typical weather characteristics. Which of the following is typical of an unstable air mass?

K22 1- Smooth air.
2- Cumuliform clouds.
3- Stratiform clouds and fog.
4- Continuous precipitation.

195. One weather phenomenon which will always occur when flying across a front is

K23 1- a change in the wind.
2- a large precipitation area, if the frontal surface is steep.
3- a large temperature change, especially at high altitudes.
4- the presence of clouds, either ahead of or behind the front.

196. Suppose airborne radar is indicating an extremely intense thunderstorm echo. This echo should be avoided by a distance of at least

K24 1- 20 miles.
2- 25 miles.
3- 30 miles.
4- 35 miles.

197. Regarding a thunderstorm, which statement is true?

K24 1- Hail is commonly found in the dissipating stage.
2- The air must have an unstable lapse rate for a thunderstorm to form.
3- Lightning usually increases in intensity during the dissipating stage.
4- As a thunderstorm approaches, the pressure rises rapidly, after it has passed, the pressure falls rapidly then remains steady.

198. Thunderstorms reach their greatest intensity during the

K24 1- updraft stage.
2- mature stage.
3- downdraft stage.
4- cumulus stage.

199. What minimum distance should exist between intense radar echoes before any attempt is made to fly between these thunderstorms?

K24 1- 10 miles.
2- 20 miles.
3- 30 miles.
4- 40 miles.

200. Which one of the statements relating to weather conditions is correct?

K25 1- Less cloudiness, fog, and precipitation over higher terrain when moist winds are blowing uphill.
2- Less cloudiness, fog, and precipitation when wind blows from water than when it blows from land.
3- Lifting or clearing of low clouds and fog when temperature/dewpoint spread is decreasing.
4- Frost on a clear night when temperature/dewpoint spread is 5° F. or less, is decreasing, and dewpoint is colder than 32° F.

201. Which statement is true concerning "structural icing"?

K25 1- Clear ice is formed by the fast freezing of small supercooled water droplets.
2- Clear ice is most often encountered while flying in cumulus clouds or freezing rain.
3- The heaviest icing will occur when the Outside Air Temperature is between -10° C. to -20° C.
4- Icing is more hazardous at low temperatures because the lower the air temperature, the greater the relative amount of water present.

202. An in-flight condition necessary for structural icing to form is

K25 1- cumuliform clouds.
2- cirrostratus clouds.
3- stratiform clouds.
4- visible moisture.

203. The heaviest icing conditions will occur

K25 1- well below freezing in stratiform type clouds.
2- at least -20° C., at approximately 6,000 feet above the freezing level.
3- at or slightly above the freezing level where the temperature is never more than a few degrees below freezing.
4- at or slightly below the freezing level where the temperature is always a few degrees above freezing.

204. The average thickness of icing conditions within layer-type clouds is usually

K25 1- one to two thousand feet.
2- two to three thousand feet.
3- three to four thousand feet.
4- four to five thousand feet.

205. In layer type clouds, continuous icing conditions are rarely found to be more than how many feet above the freezing level?

K25 1- 2,000.
2- 3,000.
3- 4,000.
4- 5,000.

206. Under what condition is pressure altitude and density altitude the same?

K26 1- At standard temperature.
2- When the altimeter setting is 29.92.
3- At sea level, when temperature is 0° F.
4- When the altimeter has no installation error.

207. What would be the standard temperature at 5,000 feet MSL?

K26 1- -1° C.
2- +5° C.
3- +10° C.
4- +15° C.

208. Which one of the following measurements can be used to determine the stability of the atmosphere?

K27 1- Atmospheric pressure.
2- Actual lapse rate.
3- Surface temperature.
4- Wind velocity.

209. Which statement is true concerning induction icing?

K25 1- Induction icing can form when the free air temperature is above freezing.
2- Induction icing will not form unless there is visible moisture in the air.
3- Induction icing will not occur on engines that are equipped with fuel injection systems.
4- Induction icing will not form unless the free air temperature is below freezing and visible liquid moisture is present.

210. What would be the approximate standard temperature at 10,000 feet MSL?

K26 1- -2° C.
2- -5° C.
3- +10° C.
4- +15° C.

211. The jet stream and associated clear air turbulence can sometimes be visually identified in flight by

K29 1- long streaks of cirrus clouds.
2- dust or haze at flight level.
3- a constant outside air temperature.
4- a high pressure center at flight level.

212. Refer to the Pilot Report for SLN and select the statement which is correct.

UA/OV SLN Ø71Ø18 141Ø FLØ8Ø/TP BE35/SK ØØ4 BKN Ø12/Ø22 BKN -OVC/TA Ø1/1C LGT-MDT RIME Ø35-Ø6Ø/RM WIND COMP HEAD Ø2Ø MHØ71 TAS 15Ø

K30 1- The temperature reported at 8,000 feet MSL is 1° C.
2- The base of the broken layer of clouds is 1,200 feet.
3- The tops of the clouds over SLN are located at 8,000 feet MSL.
4- Light to moderate rime icing occurred 35 miles from SLN on a magnetic heading of 065°.

213. What angular deviation from a VOR course centerline is represented by a 1/2 scale deflection of the CDI?

M04 1- 2 degrees.
2- 4 degrees.
3- 5 degrees.
4- 10 degrees.

214. A pilot can expect a wind shear zone in a temperature inversion, whenever the windspeed at 2,000 to 4,000 feet above the surface is at least

K29 1- 5 knots.
2- 10 knots.
3- 15 knots.
4- 25 knots.

215. Which of the following conditions should a pilot anticipate in the situation given?

K29 1- Less cloudiness, fog, and precipitation when wind blows from water than when it blows from land.
2- Lifting or clearing of low clouds and fog when temperature/dewpoint spread is decreasing.
3- Cloudiness, fog, and precipitation over higher terrain when moist winds are blowing uphill.
4- Frost on an overcast night when temperature/dewpoint spread is 8° F. or more, is increasing, and dewpoint is warmer than 32° F.

216. An aircraft which is located 30 miles from a VOR station and shows a 1/2 scale deflection on the CDI would be how far from the selected course centerline?

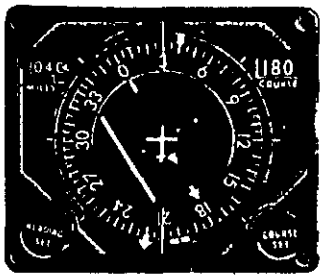
M04 1- 1-1/2 miles.
2- 2-1/2 miles.
3- 3-1/2 miles.
4- 4-1/2 miles.

217. What angular deviation from a VOR course centerline is represented by a full-scale deflection of the CDI?

M04 1- 2 degrees.
2- 4 degrees.
3- 5 degrees.
4- 10 degrees.

218. When using VOR for navigation, which of the following should be considered as station passage?

M04 1- The first positive change to FROM on the indicator.
2- The moment the TO-FROM indicator becomes blank.
3- The first full-scale deflection of the CDI.
4- The first movement of the CDI as the airplane enters the zone of confusion.



1

219. Illustration "1" above shows the airplane to be located in which general direction from the VORTAC?

M04 1- Northeast of the VORTAC.
2- Southeast of the VORTAC.
3- Northwest of the VORTAC.
4- Southwest of the VORTAC.

220. Refer to Illustration "1" above. If the airplane is turned to maintain a heading of 230° in a no-wind condition, it will intercept the

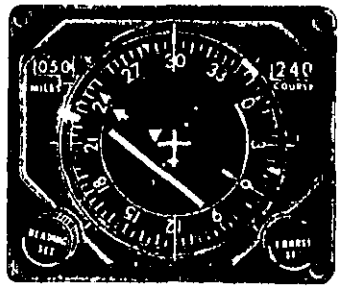
M04 1- 170 radial.
2- 180 radial.
3- 210 radial.
4- 360 radial.

221. Which of the following should be considered as station passage when using VOR?

M04 1- The first full-scale deflection of the CDI.
2- The first complete reversal of the TO-FROM indicator.
3- The moment the TO-FROM indicator becomes blank.
4- The first flickering of the TO-FROM indicator and CDI as the station is approached.

222. Assume a VOR receiver with normal 5 dot course sensitivity shows a one dot deflection at 30 nautical miles from the station. The aircraft would be displaced approximately how far from the course centerline?

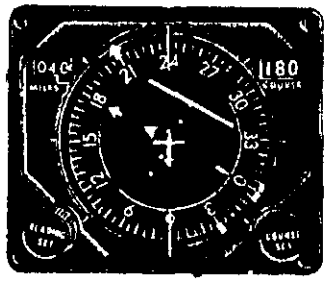
M04 1- 1 nautical mile.
2- 2 nautical miles.
3- 3 nautical miles.
4- 4 nautical miles.



2

223. Illustration "2" above shows the airplane to be located in which general direction from the VORTAC?

M04 1- Northeast of the VORTAC.
2- Southeast of the VORTAC.
3- Northwest of the VORTAC.
4- Southwest of the VORTAC.



3

224. Illustration "3" above shows the airplane to be located in which general direction from the VORTAC?

M04 1- Northeast of the VORTAC.
2- Southeast of the VORTAC.
3- Northwest of the VORTAC.
4- Southwest of the VORTAC.

225. Assume a VOR receiver with normal 5 dot course sensitivity, shows a three dot deflection at 30 nautical miles from the station. The aircraft would be displaced approximately how far from the course centerline?

M04 1- One nautical mile.
2- Two nautical miles.
3- Three nautical miles.
4- Five nautical miles.

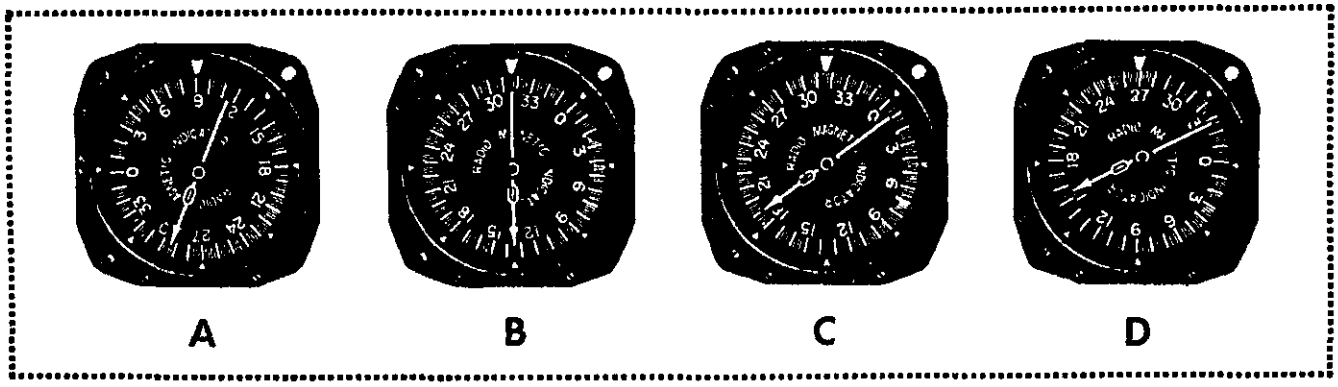



FIG-11

226. Refer to Fig. 11 above. If the Radio Magnetic Indicator is tuned to a VOR, which of the RMI illustrations indicates the airplane is on the 335 radial?

M13 1- A.
2- B.
3- C.
4- D.

227. Refer to Fig. 11 above. If the Radio Magnetic Indicator is tuned to a VOR, which of the RMI illustrations indicates the airplane is on the 010 radial?

M13 1- A.
2- B.
3- C.
4- D.

228. Assume a VOR receiver, with normal 5 dot course sensitivity, shows a two dot deflection at 30 nautical miles from the station. The aircraft would be displaced approximately how far from the course centerline?

M04 1- 1 nautical mile.
2- 2 nautical miles.
3- 3 nautical miles.
4- 4 nautical miles.

229. Assume a VOR receiver, with normal 5 dot course sensitivity, shows a two dot deflection at 15 nautical miles from the station. The aircraft would be displaced approximately how far from the course centerline?

M04 1- 1 nautical mile.
2- 2 nautical miles.
3- 3 nautical miles.
4- 4 nautical miles.

230. Refer to Fig. 11 above. If the Radio Magnetic Indicator is tuned to a VOR, which of the RMI illustrations indicates the airplane is on the 315 radial?

M13 1- A.
2- B.
3- C.
4- D.

231. Refer to Fig. 11 above. If the Radio Magnetic Indicator is tuned to a VOR, which of the RMI illustrations indicates the airplane is on the 115 radial?

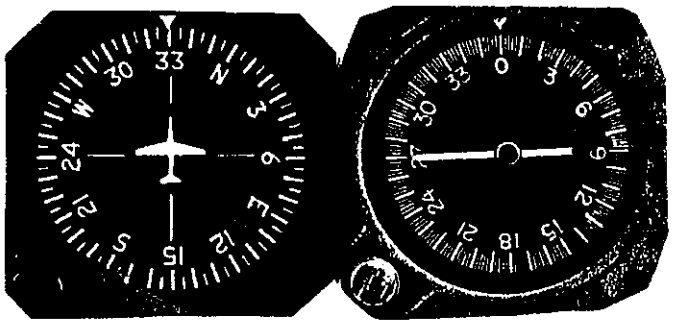
M13 1- A.
2- B.
3- C.
4- D.

232. When checking the sensitivity of a VOR receiver, the number of degrees in course change as the OBS is rotated to move the CDI from center to the last dot on either side, should be between

M04 1- 2° and 5°.
2- 5° and 6°.
3- 8° and 10°.
4- 10° and 12°.

233. To compensate for the effects of torque, which statement is correct?

002 1- Right rudder trim must be added if airspeed is decreased (power constant).
2- Right rudder trim must be added if power is reduced (airspeed constant).
3- Right rudder trim must be added if airspeed is increased (power constant).
4- Left rudder must be added if power is increased (airspeed constant).



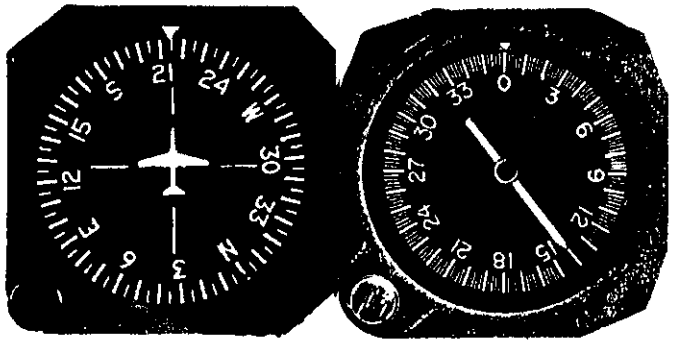
Group 1

234. Refer to instrument group 1 above. On the basis of this information, the magnetic bearing to the station would be

M13 1- 030°.
2- 060°.
3- 240°.
4- 270°.

236. Refer to instrument group 1 above. On the basis of this information, the magnetic bearing from the station would be

M13 1- 030°.
2- 060°.
3- 240°.
4- 270°.



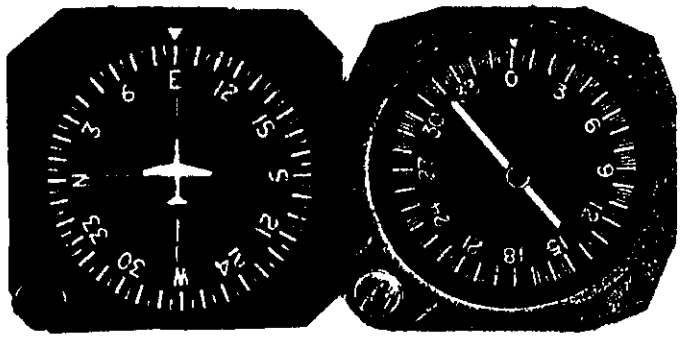
Group 2

235. Refer to instrument group 2 above. On the basis of this information, the magnetic bearing to the station would be

M13 1- 085°.
2- 175°.
3- 255°.
4- 355°.

237. Refer to instrument group 2 above. On the basis of this information, the magnetic bearing from the station would be

M13 1- 085°.
2- 175°.
3- 255°.
4- 355°.



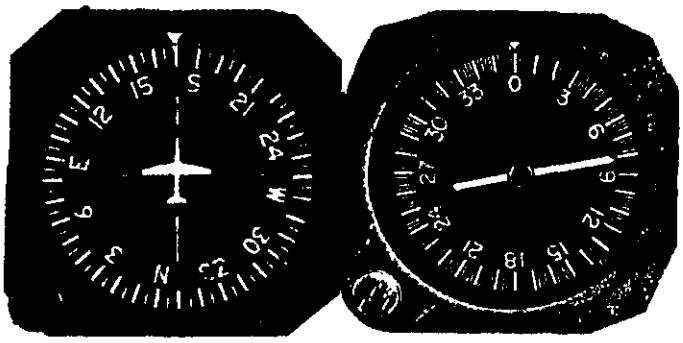
Group 3

238. Refer to instrument group 3 above. On the basis of this information, the magnetic bearing to the station would be

M13 1- 050°.
2- 080°.
3- 250°.
4- 260°.

240. Refer to instrument group 3 above. On the basis of this information, the magnetic bearing from the station would be

M13 1- 050°.
2- 130°.
3- 230°.
4- 320°.



Group 4

239. Refer to instrument group 4 above. On the basis of this information, the magnetic bearing to the station would be

M13 1- 070°.
2- 080°.
3- 250°.
4- 260°.

241. Refer to instrument group 4 above. On the basis of this information, the magnetic bearing from the station would be

M13 1- 070°.
2- 080°.
3- 250°.
4- 260°.

242. The three conditions which determine pitch attitude required to maintain level flight are

004 1- total lift, total drag and thrust.
2- flightpath, wind velocity, and angle of attack.
3- relative wind, pressure altitude, and vertical lift component.
4- airspeed, air density, and aircraft weight.

243. Consider the following and select the true statement concerning lift on an airplane's wing.

004 1- Wing lift always acts in an equal but opposite direction of the wing's relative wind.
2- Wing lift always acts in a direction perpendicular to the earth's surface.
3- Wing lift always acts in a direction perpendicular to the wing's relative wind.
4- Wing lift is caused by the high pressure area which forms on the top of the wing's leading edge.

244. If severe turbulence is encountered during your IFR flight, the airplane should be slowed to the design maneuvering speed because the

017 1- maneuverability of the airplane will be increased.
2- amount of excess load that can be imposed on the wing will be decreased.
3- airplane will stall at a lower angle of attack, giving an increased margin of safety.
4- airplane will not stall as rapidly, giving an increased margin of safety.

245. Which statement is correct concerning the effects of the load distribution in an airplane?

Q14 1- Stall speed will be increased if the airplane is loaded toward the forward CG limit.
2- Longitudinal stability will be improved if the airplane is loaded toward the rearward CG limit.
3- Stall characteristics will be improved if the airplane is loaded toward the rearward CG limit.
4- Performance (rate of climb and airspeed) will be improved if the airplane is loaded toward the forward CG limit.

246. When an airplane is accelerated, some attitude indicators will precess and incorrectly indicate a

R01 1- right turn.
2- left turn.
3- climb.
4- descent.

247. When an airplane is decelerated, some attitude indicators will precess and incorrectly indicate a

R01 1- climb.
2- descent.
3- right turn.
4- left turn.

248. Suppose a flight is made from an area of high pressure into an area of lower pressure without the altimeter setting being adjusted. If a constant indicated altitude is maintained, the altimeter would indicate

R04 1- the actual altitude above the ground.
2- the actual altitude above sea level.
3- higher than the actual altitude above sea level.
4- lower than the actual altitide above sea level.

249. If a standard rate turn is maintained, how long would it take to turn 270°?

S04 1- 30 seconds.
2- 1 minute.
3- 1 minute 20 seconds.
4- 1 minute 30 seconds.

250. Which statement is true about "Profile Descent" procedures?

S12 1- Profile descent procedures are based on an altitude loss of approximately 600 feet per flying mile.
2- Profile descent procedures are established only for runways having published precision approach procedures, PAR or ILS.
3- A profile descent is basically an interrupted descent where the aircraft is descended in stages to different arrival altitudes.
4- When crossing altitudes and speed restrictions are depicted on Profile Descent Charts, ATC will expect the pilot to descend first to the crossing altitude and then reduce speed.

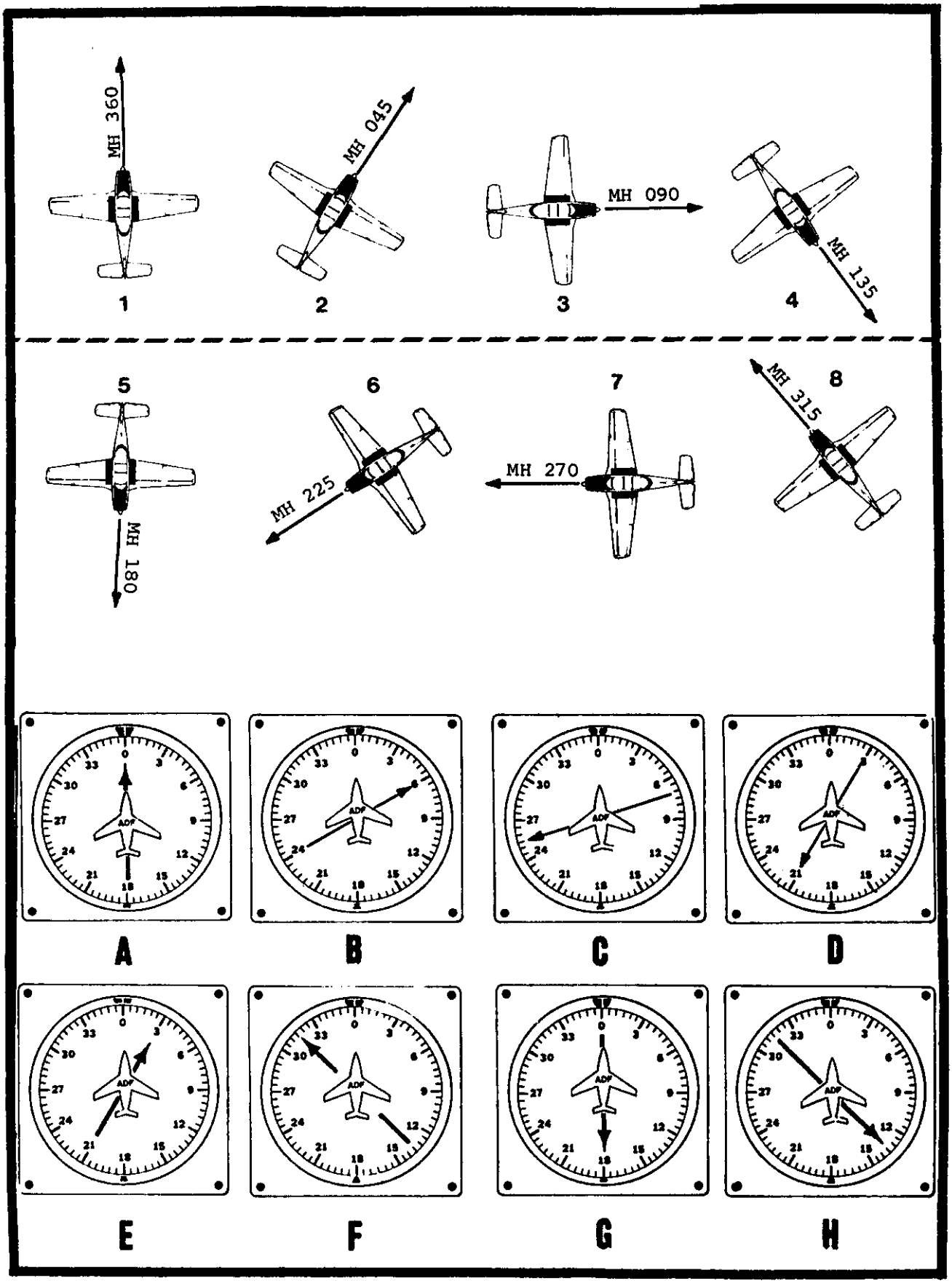

MH 360
MH 045
MH 090
MH 135
MH 180
MH 225
MH 270
MH 315
1
2
3
4
5
6
7
8
A
B
C
D
E
F
G
H

FIG 12

251. Refer to Fig. 12. If the magnetic heading shown for airplane 8 is maintained, which ADF illustration would indicate the airplane is on the 090° magnetic bearing from the station?

M13 1- B.
2- C.
3- D.
4- F.

252. Refer to Fig. 12. If the magnetic heading shown for airplane 5 is maintained, which ADF illustration would indicate the airplane is on the 210° magnetic bearing to the station?

M13 1- B.
2- C.
3- D.
4- H.

253. Refer to Fig. 12. If the magnetic heading shown for airplane 4 is maintained, which ADF illustration would indicate the airplane is on the 135° magnetic bearing to the station?

M13 1- A.
2- D.
3- F.
4- H.

254. Refer to Fig. 12. If the magnetic heading shown for airplane 3 is maintained, which ADF Illustration would indicate the airplane is on the 120° magnetic bearing to the station?

M13 1- B.
2- D.
3- E.
4- H.

255. Refer to Fig. 12. If the magnetic heading shown for airplane 2 is maintained, which ADF illustration would indicate the airplane is on the 255° magnetic bearing to the station?

M13 1- B.
2- D.
3- E.
4- H.

256. During flight, if the pitot-tube becomes clogged with ice, which of the following instruments would be affected?

R08 1- The altimeter only.
2- The airspeed indicator only.
3- The airspeed indicator and the altimeter.
4- The airspeed indicator, altimeter, and vertical speed indicator.

257. Refer to Fig. 12. If the magnetic heading shown for airplane 6 is maintained, which ADF illustration would indicate the airplane is on the 255° magnetic bearing from the station?

M13 1- B.
2- D.
3- E.
4- H.

258. Refer to Fig. 12. If the magnetic heading shown for airplane 7 is maintained, which ADF illustration would indicate the airplane is on the 120° magnetic bearing from the station?

M13 1- B.
2- D.
3- E.
4- H.

259. Refer to Fig. 12. If the magnetic heading shown for airplane 1 is maintained, which ADF illustration would indicate the airplane is on the 060° magnetic bearing to the station?

M13 1- B.
2- D.
3- E.
4- H.

260. The primary reason the angle of attack must be increased to maintain a constant altitude during a coordinated turn, is because the

006 1- vertical component of lift has decreased as the result of the bank.
2- use of ailerons has increased the drag.
3- horizontal component of lift has decreased as the result of the bank.
4- thrust is acting in a different direction, causing a reduction in airspeed and loss of lift.

# CRUISE POWER SETTINGS

## 55% MAXIMUM CONTINUOUS POWER (OR FULL THROTTLE)

| PRESS ALT | ISA -36°F (-20°C) | | | | | | | | STANDARD DAY (ISA) | | | | | | | | ISA +36°F (+20°C) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | OAT | | ENGINE SPEED | MAN PRESS | FUEL FLOW | | TAS | | OAT | | ENGINE SPEED | MAN PRESS | FUEL FLOW | | TAS | | OAT | | ENGINE SPEED | MAN PRESS | FUEL FLOW | | TAS | |
| FEET | °F | °C | RPM | IN HG | PPH | GPH | KTS | MPH | °F | °C | RPM | IN HG | PPH | GPH | KTS | MPH | °F | °C | RPM | IN HG | PPH | GPH | KTS | MPH |
| SL | 23 | -5 | 2300 | 20.6 | 47.4 | 7.9 | 112 | 129 | 59 | 15 | 2300 | 21.1 | 47.4 | 7.9 | 115 | 132 | 95 | 35 | 2300 | 21.6 | 47.4 | 7.9 | 116 | 134 |
| 1000 | 19 | -7 | 2300 | 20.3 | 47.4 | 7.9 | 113 | 130 | 55 | 13 | 2300 | 20.8 | 47.4 | 7.9 | 116 | 133 | 91 | 33 | 2300 | 21.3 | 47.4 | 7.9 | 116 | 134 |
| 2000 | 16 | -9 | 2300 | 20.1 | 47.4 | 7.9 | 114 | 131 | 52 | 11 | 2300 | 20.6 | 47.4 | 7.9 | 116 | 134 | 88 | 31 | 2300 | 21.1 | 47.4 | 7.9 | 117 | 135 |
| 3000 | 12 | -11 | 2300 | 19.8 | 47.4 | 7.9 | 115 | 132 | 48 | 9 | 2300 | 20.4 | 47.4 | 7.9 | 116 | 134 | 84 | 29 | 2300 | 20.9 | 47.4 | 7.9 | 118 | 136 |
| 4000 | 9 | -13 | 2300 | 19.6 | 47.4 | 7.9 | 116 | 133 | 45 | 7 | 2300 | 20.2 | 47.4 | 7.9 | 117 | 135 | 81 | 27 | 2300 | 20.7 | 47.4 | 7.9 | 119 | 137 |
| 5000 | 5 | -15 | 2300 | 19.4 | 47.4 | 7.9 | 116 | 134 | 41 | 5 | 2300 | 19.9 | 47.4 | 7.9 | 118 | 136 | 77 | 25 | 2300 | 20.5 | 47.4 | 7.9 | 119 | 137 |
| 6000 | 2 | -17 | 2300 | 19.2 | 47.4 | 7.9 | 117 | 135 | 38 | 3 | 2300 | 19.7 | 47.4 | 7.9 | 118 | 136 | 74 | 23 | 2300 | 20.3 | 47.4 | 7.9 | 120 | 138 |
| 7000 | 2 | -19 | 2300 | 18.9 | 47.4 | 7.9 | 117 | 135 | 34 | 1 | 2300 | 19.5 | 47.4 | 7.9 | 119 | 137 | 70 | 21 | 2300 | 20.1 | 47.4 | 7.9 | 121 | 139 |
| 8000 | 5 | -21 | 2300 | 18.7 | 47.4 | 7.9 | 118 | 136 | 31 | -1 | 2300 | 19.3 | 47.4 | 7.9 | 120 | 138 | 67 | 19 | 2300 | 19.9 | 47.4 | 7.9 | 122 | 140 |
| 9000 | 9 | -23 | 2300 | 18.5 | 47.4 | 7.9 | 119 | 137 | 27 | -3 | 2300 | 19.1 | 47.4 | 7.9 | 121 | 139 | 63 | 17 | 2300 | 19.7 | 47.4 | 7.9 | 123 | 141 |
| 10,000 | 13 | -25 | 2300 | 18.3 | 47.4 | 7.9 | 120 | 138 | 23 | -5 | 2300 | 18.9 | 47.4 | 7.9 | 121 | 139 | 59 | 15 | 2300 | 19.5 | 47.4 | 7.9 | 123 | 141 |
| 11,000 | 16 | -27 | 2300 | 18.1 | 47.4 | 7.9 | 120 | 138 | 20 | -7 | 2300 | 18.7 | 47.4 | 7.9 | 122 | 140 | 56 | 13 | 2300 | 19.7 | 46.8 | 7.8 | 122 | 140 |
| 12,000 | 20 | -29 | 2300 | 17.9 | 47.4 | 7.9 | 121 | 139 | 16 | -9 | 2300 | 18.4 | 46.8 | 7.8 | 122 | 140 | 52 | 11 | 2300 | 17.9 | 46.2 | 7.7 | – | – |

NOTES: 1. FULL THROTTLE MANIFOLD PRESSURE SETTINGS ARE APPROXIMATE
2. SHADED AREA REPRESENTS OPERATION WITH FULL THROTTLE

## 65% MAXIMUM CONTINUOUS POWER (OR FULL THROTTLE)

| PRESS ALT | ISA -36°F (-20°C) | | | | | | | | STANDARD DAY (ISA) | | | | | | | | ISA +36°F (+20°C) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | OAT | | ENGINE SPEED | MAN PRESS | FUEL FLOW | | TAS | | OAT | | ENGINE SPEED | MAN PRESS | FUEL FLOW | | TAS | | OAT | | ENGINE SPEED | MAN PRESS | FUEL FLOW | | TAS | |
| FEET | °F | °C | RPM | IN HG | PPH | GPH | KTS | MPH | °F | °C | RPM | IN HG | PPH | GPH | KTS | MPH | °F | °C | RPM | IN HG | PPH | GPH | KTS | MPH |
| SL | 23 | -5 | 2400 | 22.3 | 54.6 | 9.1 | 123 | 141 | 59 | 15 | 2400 | 22.8 | 54.6 | 9.1 | 124 | 143 | 95 | 35 | 2400 | 23.5 | 54.6 | 9.1 | 127 | 146 |
| 1000 | 19 | -7 | 2400 | 22.0 | 54.6 | 9.1 | 123 | 142 | 55 | 13 | 2400 | 22.6 | 54.6 | 9.1 | 125 | 144 | 91 | 33 | 2400 | 23.2 | 54.6 | 9.1 | 128 | 147 |
| 2000 | 16 | -9 | 2400 | 21.7 | 54.6 | 9.1 | 124 | 143 | 52 | 11 | 2400 | 22.4 | 54.6 | 9.1 | 126 | 145 | 88 | 31 | 2400 | 23.0 | 54.6 | 9.1 | 129 | 148 |
| 3000 | 12 | -11 | 2400 | 21.5 | 54.6 | 9.1 | 125 | 144 | 48 | 9 | 2400 | 22.2 | 54.6 | 9.1 | 128 | 147 | 84 | 29 | 2400 | 22.8 | 54.6 | 9.1 | 129 | 149 |
| 4000 | 9 | -13 | 2400 | 21.2 | 54.6 | 9.1 | 126 | 145 | 45 | 7 | 2400 | 21.9 | 54.6 | 9.1 | 129 | 148 | 81 | 27 | 2400 | 22.6 | 54.6 | 9.1 | 130 | 150 |
| 5000 | 5 | -15 | 2400 | 20.9 | 54.6 | 9.1 | 127 | 146 | 41 | 5 | 2400 | 21.7 | 54.6 | 9.1 | 129 | 149 | 77 | 25 | 2400 | 22.3 | 54.6 | 9.1 | 131 | 151 |
| 6000 | 2 | -17 | 2400 | 20.7 | 54.6 | 9.1 | 128 | 147 | 38 | 3 | 2400 | 21.5 | 54.6 | 9.1 | 130 | 150 | 74 | 23 | 2400 | 22.1 | 54.6 | 9.1 | 133 | 153 |
| 7000 | -2 | -19 | 2400 | 20.5 | 54.6 | 9.1 | 129 | 148 | 34 | 1 | 2400 | 21.3 | 54.6 | 9.1 | 131 | 151 | 70 | 21 | 2400 | 21.9 | 54.6 | 9.1 | 134 | 154 |
| 8000 | -5 | -21 | 2400 | 20.3 | 54.6 | 9.1 | 129 | 149 | 31 | -1 | 2400 | 21.1 | 54.6 | 9.1 | 132 | 152 | 67 | 19 | 2400 | 21.6 | 54.6 | 9.1 | 134 | 154 |
| 9000 | -9 | -23 | 2400 | 20.0 | 54.6 | 9.1 | 130 | 150 | 27 | -3 | 2400 | 20.7 | 54.6 | 9.1 | 133 | 153 | 63 | 17 | 2400 | 20.8 | 52.8 | 8.8 | 132 | 152 |
| 10,000 | -13 | -25 | 2400 | 19.8 | 54.0 | 9.0 | 131 | 151 | 23 | -5 | 2400 | 19.8 | 52.8 | 8.8 | 130 | 150 | 59 | 15 | 2400 | 19.9 | 51.8 | 8.8 | 129 | 149 |
| 11,000 | -16 | -27 | 2400 | 18.7 | 52.8 | 8.8 | 129 | 149 | 20 | -7 | 2400 | 19.1 | 51.6 | 8.6 | 129 | 148 | 56 | 13 | 2400 | 19.1 | 49.8 | 8.3 | 127 | 146 |
| 12,000 | -20 | -29 | 2400 | 17.9 | 51.0 | 8.5 | 127 | 146 | 16 | -9 | 2400 | 18.2 | 51.0 | 8.5 | 126 | 146 | 52 | 11 | 2400 | 18.3 | 47.4 | 7.9 | 123 | 142 |

NOTES: 1. FULL THROTTLE MANIFOLD PRESSURE SETTINGS ARE APPROXIMATE
2. SHADED AREA REPRESENTS OPERATION WITH FULL THROTTLE

## 75% MAXIMUM CONTINUOUS POWER (OR FULL THROTTLE)

| PRESS ALT | ISA -36°F (-20°C) | | | | | | | | STANDARD DAY (ISA) | | | | | | | | ISA +36°F (+20°C) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | OAT | | ENGINE SPEED | MAN PRESS | FUEL FLOW | | TAS | | OAT | | ENGINE SPEED | MAN PRESS | FUEL FLOW | | TAS | | OAT | | ENGINE SPEED | MAN PRESS | FUEL FLOW | | TAS | |
| FEET | °F | °C | RPM | IN HG | PPH | GPH | KTS | MPH | °F | °C | RPM | IN HG | PPH | GPH | KTS | MPH | °F | °C | RPM | IN HG | PPH | GPH | KTS | MPH |
| SL | 23 | -5 | 2500 | 23.8 | 72.6 | 12.1 | 131 | 151 | 59 | 15 | 2500 | 24.4 | 72.6 | 12.1 | 134 | 154 | 95 | 35 | 2500 | 25.1 | 72.6 | 12.1 | 136 | 156 |
| 1000 | 19 | -7 | 2500 | 23.6 | 72.6 | 12.1 | 132 | 152 | 55 | 13 | 2500 | 24.2 | 72.6 | 12.1 | 135 | 155 | 91 | 33 | 2500 | 24.8 | 72.6 | 12.1 | 137 | 158 |
| 2000 | 16 | -9 | 2500 | 23.4 | 72.6 | 12.1 | 133 | 153 | 52 | 11 | 2500 | 24.0 | 72.6 | 12.1 | 136 | 156 | 88 | 31 | 2500 | 24.6 | 72.6 | 12.1 | 138 | 159 |
| 3000 | 12 | -11 | 2500 | 23.2 | 72.6 | 12.1 | 134 | 154 | 48 | 9 | 2500 | 23.8 | 72.6 | 12.1 | 136 | 157 | 84 | 29 | 2500 | 24.4 | 72.6 | 12.1 | 139 | 160 |
| 4000 | 9 | -13 | 2500 | 23.0 | 72.6 | 12.1 | 135 | 155 | 45 | 7 | 2500 | 23.6 | 72.6 | 12.1 | 137 | 158 | 81 | 27 | 2500 | 24.2 | 72.6 | 12.1 | 140 | 161 |
| 5000 | 5 | -15 | 2500 | 22.8 | 72.6 | 12.1 | 136 | 157 | 41 | 5 | 2500 | 23.4 | 72.6 | 12.1 | 139 | 160 | 77 | 25 | 2500 | 24.0 | 72.6 | 12.1 | 141 | 162 |
| 6000 | 2 | -17 | 2600 | 22.0 | 73.2 | 12.2 | 137 | 158 | 38 | 3 | 2600 | 22.5 | 73.2 | 12.2 | 140 | 161 | 74 | 23 | 2600 | 23.1 | 73.2 | 12.2 | 143 | 164 |
| 7000 | 2 | -19 | 2600 | 21.8 | 73.2 | 12.2 | 138 | 159 | 34 | 1 | 2600 | 22.3 | 73.2 | 12.2 | 141 | 162 | 70 | 21 | 2600 | 22.6 | 72.0 | 12.0 | 142 | 163 |
| 8000 | 5 | -21 | 2600 | 21.6 | 73.2 | 12.2 | 139 | 160 | 31 | -1 | 2600 | 21.6 | 72.0 | 12.0 | 141 | 162 | 67 | 19 | 2600 | 21.8 | 70.2 | 11.7 | 141 | 162 |
| 9000 | 9 | -23 | 2600 | 21.1 | 72.0 | 12.0 | 139 | 160 | 27 | -3 | 2600 | 20.9 | 70.2 | 11.7 | 139 | 160 | 63 | 17 | 2600 | 21.0 | 68.4 | 11.4 | 139 | 160 |
| 10,000 | 13 | -25 | 2600 | 20.2 | 69.6 | 11.6 | 137 | 158 | 23 | -5 | 2600 | 20.1 | 67.8 | 11.3 | 137 | 158 | 59 | 15 | 2600 | 20.2 | 66.0 | 11.0 | 136 | 157 |
| 11,000 | 16 | -27 | 2600 | 19.5 | 67.8 | 11.3 | 136 | 156 | 20 | -7 | 2600 | 19.3 | 66.0 | 11.0 | 136 | 156 | 56 | 13 | 2600 | 19.4 | 64.2 | 10.7 | 135 | 155 |
| 12,000 | 20 | -29 | 2600 | 18.8 | 66.6 | 11.1 | 134 | 154 | 16 | -9 | 2600 | 18.6 | 64.2 | 10.7 | 134 | 154 | 52 | 11 | 2600 | 18.6 | 62.4 | 10.4 | 132 | 152 |

NOTES 1. FULL THROTTLE MANIFOLD PRESSURE SETTINGS ARE APPROXIMATE
2. SHADED AREA REPRESENTS OPERATION WITH FULL THROTTLE

FIG-13

261. Refer to the Cruise Power Charts, Fig. 13, and consider the following:

Power . . . . . 55%
Pressure altitude . . . . 7,000 feet
Temperature . . . . . 19° C.
Fuel quantity(usable) . . 35 gallons

Under these conditions, approximately how much flight time would be available with a 45 minute fuel reserve still remaining?

Q03 1- 3 hours 20 minutes.
2- 3 hours 41 minutes.
3- 4 hours 10 minutes.
4- 4 hours 25 minutes.

262. Refer to the Cruise Power Charts, Fig. 13, and consider the following:

Power . . . . . 75%
Pressure altitude . . . . 11,000 feet
Temperature . . . . . 13° C.
Fuel quantity(usable) . . 240 lbs.

Under these conditions, approximately how much flight time would be available with a 45 minute fuel reserve still remaining?

Q03 1- 2 hours 59 minutes.
2- 3 hours 45 minutes.
3- 4 hours 10 minutes.
4- 4 hours 20 minutes.

263. Refer to the Cruise Power Charts, Fig. 13, and consider the following conditions:

Q03 Power . . . . . 65%
Pressure altitude . . . . . 8,000 feet
Temperature . . . . . Standard
Fuel quantity (usable) . . 41 gallons

Under the conditions given, approximately how much flight time would be available with a 45 minute fuel reserve still remaining?

1- 3 hours 45 minutes.
2- 4 hours 30 minutes.
3- 4 hours 45 minutes.
4- 5 hours 10 minutes.

264. Density altitude is pressure altitide corrected for

R04 1- nonstandard true altitude.
2- nonstandard pressure.
3- nonstandard temperature.
4- standard sea-level conditions.

265. Refer to the Cruise Power Charts, Fig. 13, and consider the following conditions:

Power . . . . . 55%
Pressure altitude . . . . . 6,000 feet
Temperature . . . . . Standard
Fuel quantity (usable) . . 50 gallons

Under these conditions, approximately how much flight time would be available with a 45 minute fuel reserve still remaining?

Q03 1- 4 hours 18 minutes.
2- 5 hours 35 minutes.
3- 5 hours 50 minutes.
4- 6 hours 18 minutes.

266. Refer to the Cruise Power Charts, Fig. 13, and consider the following conditions:

Power . . . . . 75%
Pressure altitude . . . . 10,000 feet
Temperature . . . . . Standard
Fuel quantity(usable) . . 270 lbs.

Under these conditions, approximately how much flight time would be available with 45 minutes fuel reserve still remaining?

Q03 1- 3 hours 14 minutes.
2- 3 hours 45 minutes.
3- 4 hours.
4- 4 hours 10 minutes.

267. Refer to the Cruise Power Charts, Fig. 13, and consider the following:

Power . . . . . 65%
Pressure altitude . . . . 10,000 feet
Temperature . . . . . Standard
Fuel quantity(usable) . . 60 gallons

Under these conditions, approximately how much flight time would be available with a 45 minute fuel reserve still remaining?

Q03 1- 4 hours 45 minutes.
2- 5 hours 20 minutes.
3- 5 hours 38 minutes.
4- 6 hours 4 minutes.

268. For each 1,000-foot increase in altitude, true airspeed will increase approximately

R06 1- 2% of the indicated airspeed.
2- 3.5% of the indicated airspeed.
3- 5% of the indicated airspeed.
4- 10% of the indicated airspeed.

269. When a climb or descent through an inversion or wind shear zone is being performed the pilot should be alert for which of the following changes in airplane performance?

Q16 1- A sudden change in airspeed.
2- A sudden surge of thrust.
3- A sudden decrease in power.
4- A fast rate of climb and a slow rate of descent.

270. During a constant-bank level turn, what effect would an increase in airspeed have on the rate and radius of turn?

Q17 1- Rate of turn would decrease, and radius of turn would decrease.
2- Rate of turn would decrease, and radius of turn would increase.
3- Rate of turn would increase, and radius of turn would decrease.
4- Rate of turn would increase, and radius of turn would increase.

271. The displacement of a turn coordinator during a coordinated turn, will

R03 1- indicate the angle of bank.
2- increase as angle of bank increases.
3- increase as angle of bank decreases.
4- remain constant for a given bank regardless of airspeed.

272. The reported altimeter setting of a given station is the

R04 1- actual barometric pressure measured at the station.
2- actual barometric pressure measured at sea level.
3- station's barometric pressure converted to mean sea level pressure.
4- station's pressure altitude adjusted for existing temperature.

273. Pressure altitude is the total pressure of the atmosphere at any given level based upon

R04 1- standard sea-level conditions.
2- true altitude above sea level.
3- absolute altitude above sea level.
4- true altitude corrected for nonstandard temperature.

274. Altimeter setting is the value to which the scale of the pressure altimeter is set so the altimeter indicates

R04 1- true altitude at field elevation.
2- pressure altitude at field elevation.
3- density altitude at sea level.
4- pressure altitude at sea level.

275. Suppose a flight is made from an area of low pressure into an area of high pressure without the altimeter setting being adjusted. If a constant indicated altitude is maintained, the altimeter would indicate

R04 1- the actual altitude above sea level.
2- higher than the actual altitude above sea level.
3- lower than the actual altitude above sea level.
4- the actual altitude above ground level.

276. If the temperature is warmer than standard, the pressure level where the altimeter will indicate 7,000 feet will be

R04 1- higher than it would under standard conditions.
2- lower than it would under standard conditions.
3- the same as it would under standard conditions.
4- the same, regardless of temperature changes.

277. Select the true statement concerning a properly functioning sensitive altimeter.

R04 1- If adjusted to the proper altimeter setting, the altimeter will assure a safe terrain clearance.
2- During a cross-country flight at 6,000 feet indicated altitude, maintaining the correct reported altimeter setting assures that the aircraft is maintaining a constant level of 6,000 feet MSL.
3- Regardless of different geographical positions, all aircraft flying at the same indicated altitude and altimeter setting will always be at the same true altitude.
4- If proper corrections are made for nonstandard temperature and pressure, the altimeter will indicate accurate information relative to terrain clearance.

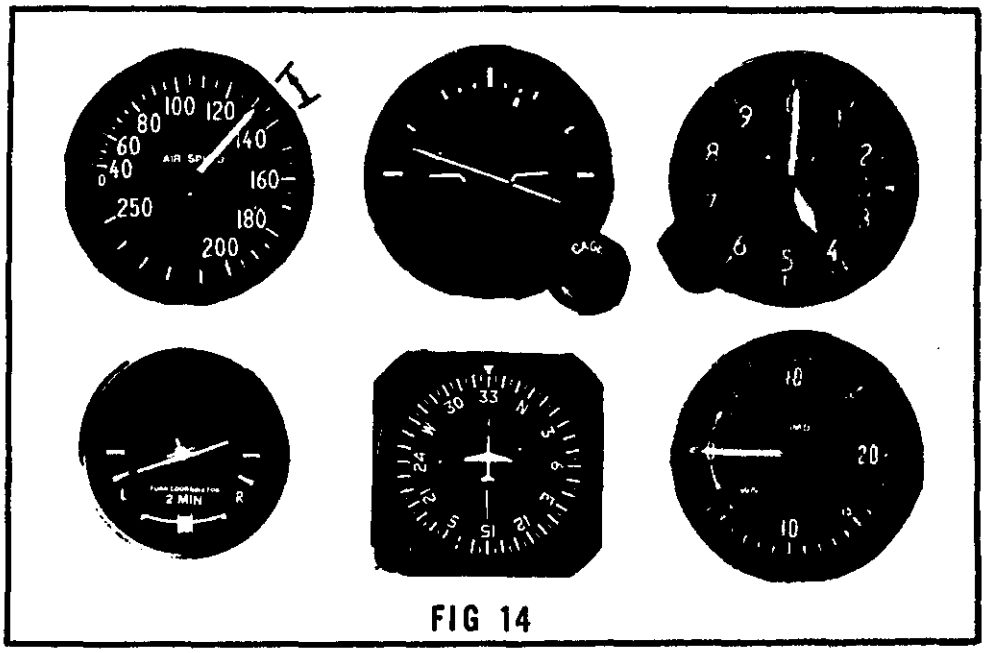



FIG 14

278. According to Fig. 14, the airplane would be in a

R03 1- 20° bank to the right.
2- 30° bank to the left.
3- 3° per second turn to the right.
4- 3° per second turn to the left.

279. The altimeter indicates the aircraft altitude in relation to

R04 1- the ground.
2- sea level.
3- the standard datum plane.
4- the pressure level set in the barometric window.

280. Suppose the barometric pressure is 30.03" Hg. If 29.92" Hg is set on the altimeter pressure scale, that altimeter will indicate an altitude that is approximately

R04 1- 10 feet too low.
2- 10 feet too high.
3- 110 feet too low.
4- 110 feet too high.

281. Suppose the barometric pressure is 28.94" Hg. If 29.92" Hg is set on the altimeter pressure scale, that altimeter will indicate an altitude that is approximately

R04 1- 98 feet too low.
2- 980 feet too low.
3- 98 feet too high.
4- 980 feet too high.

282. Regardless of the flight altitude, the effect of lower than standard pressure on an uncorrected altimeter is to place the aircraft

R04 1- lower than the altimeter indicates.
2- higher than it would if the pressure were standard.
3- at the same altitude as the altimeter indicates.
4- 100 feet higher per each 1 inch difference between the actual setting and the corrected setting on the altimeter.

283. If, while in level flight, it becomes necessary to use an alternate source of static pressure vented inside the airplane, which of the following variations in instrument indications should the pilot expect?

R06 1- The altimeter will read higher than normal, airspeed will not change, and the vertical speed indicator will momentarily show a descent.
2- The altimeter will read lower than normal, airspeed lower than normal, and the vertical speed indicator will momentarily show a descent.
3- The altimeter will read higher than normal, airspeed greater than normal, and the vertical speed indicator will momentarily show a climb.
4- The altimeter will read lower than normal, airspeed greater than normal, and the vertical speed indicator will momentarily show a climb and then a descent.

284. Suppose the barometric pressure is 29.84" Hg. If 29.92" Hg is set on the altimeter pressure scale, that altimeter will indicate an altitude that is approximately

R04 1- 80 feet too high.
2- 120 feet too low.
3- 800 feet too high.
4- 1,120 feet too low.

285. Suppose the barometric pressure is 29.98" Hg. If 29.92" Hg is set on the altimeter pressure scale, that altimeter will indicate an altitude that is approximately

R04 1- 6 feet too low.
2- 60 feet too high.
3- 60 feet too low.
4- 600 feet too low.

286. Suppose the barometric pressure is 30.03" Hg. If 29.92" Hg is set on the altimeter pressure scale, that altimeter will indicate an altitude that is approximately

R04 1- 110 feet too low.
2- 110 feet too high.
3- 1,120 feet too low.
4- 1,120 feet too high.

287. Airspeed which has been corrected for installation and instrument error, is called

R06 1- calibrated airspeed.
2- true airspeed.
3- equivalent airspeed.
4- indicated airspeed.

288. If, at 5,000 feet PA, the ambient temperature is +35° C. and the calibrated airspeed is 180 knots, the true airspeed would be approximately

R06 1- 150 knots.
2- 170 knots.
3- 180 knots.
4- 204 knots.

289. If, at 8,000 feet PA, the ambient temperature is -10° C. and the calibrated airspeed is 145 knots, the true airspeed would be approximately

R06 1- 125 knots.
2- 128 knots.
3- 160 knots.
4- 168 knots.

290. If, at 6,000 feet PA, the ambient temperature is +20° C. and the calibrated airspeed is 130 knots, the true airspeed would be approximately

R06 1- 116 knots.
2- 125 knots.
3- 138 knots.
4- 146 knots.

291. If, at 9,000 feet PA, the ambient temperature is +5° C. and the calibrated airspeed is 150 knots, the true airspeed would be approximately

R06 1- 129 knots.
2- 132 knots.
3- 171 knots.
4- 174 knots.

292. If, at 7,000 feet PA, the ambient temperature is +40° C. and the calibrated airspeed is 165 knots, the true airspeed would be approximately

R06 1- 134 knots.
2- 158 knots.
3- 192 knots.
4- 196 knots.

293. If, at 10,000 feet PA, the ambient temperature is -10° C. and the calibrated airspeed is 150 knots, the true airspeed would be approximately

R06 1- 124 knots.
2- 173 knots.
3- 180 knots.
4- 185 knots.

294. If, at 12,000 feet PA, the ambient temperature is -15° C. and the calibrated airspeed is 165 knots, the true airspeed would be approximately

R06 1- 132 knots.
2- 139 knots.
3- 196 knots.
4- 205 knots.

295. The pressure altitude at a given location is indicated on the altimeter after the altimeter is set to

R10 1- 29.92.
2- the current altimeter setting.
3- the field elevation.
4- the density altitude.

296. Assume it becomes necessary to use an alternate source of static pressure which is vented inside the airplane. Under this condition the pilot can expect which of the following?

R06 1- The vertical speed will momentarily show a descent.
2- The altimeter will read lower than normal.
3- The altimeter will read higher than normal.
4- The airspeed will read lower than normal.

297. Assume it becomes necessary to use an alternate source of static pressure which is vented inside the airplane. Under this condition, which of the following should the pilot expect?

R06 1- The airspeed will read lower than normal.
2- The airspeed will read greater than normal.
3- The vertical speed will momentarily show a descent.
4- The altimeter will read lower than normal.

298. During a precision radar or ILS approach, the rate of descent required to remain on the glide slope will

S17 1- increase as the groundspeed increases.
2- decrease as the groundspeed increases.
3- remain the same regardless of the true airspeed.
4- remain the same regardless of groundspeed.

299. Suppose at an altitude of 6,500 feet MSL, the current altimeter setting is 30.42. The pressure altitude would be approximately

R10 1- 6,000 feet.
2- 6,500 feet.
3- 7,000 feet.
4- 7,500 feet.

300. Errors in both pitch and bank indication on an attitude indicator are usually at a maximum as the aircraft rolls out of a

R12 1- 90° turn.
2- 180° turn.
3- 270° turn.
4- 360° turn.

301. If, while in level flight, it becomes necessary to use an alternate source of static pressure vented inside the airplane, which of the following should the pilot expect?

R06 1- The airspeed to read lower than normal.
2- The altimeter to read lower than normal.
3- The vertical speed to momentarily show a descent.
4- The vertical speed to momentarily show a climb.

302. Which statement is true concerning magnetic deviation of a compass?

R09 1- Deviation is the same for all airplanes on various headings.
2- Deviation is the same for all airplanes in the same locality.
3- Deviation is different in a given airplane in different localities.
4- Deviation is different on various headings of a given airplane.

303. Deviation in a magnetic compass is caused by

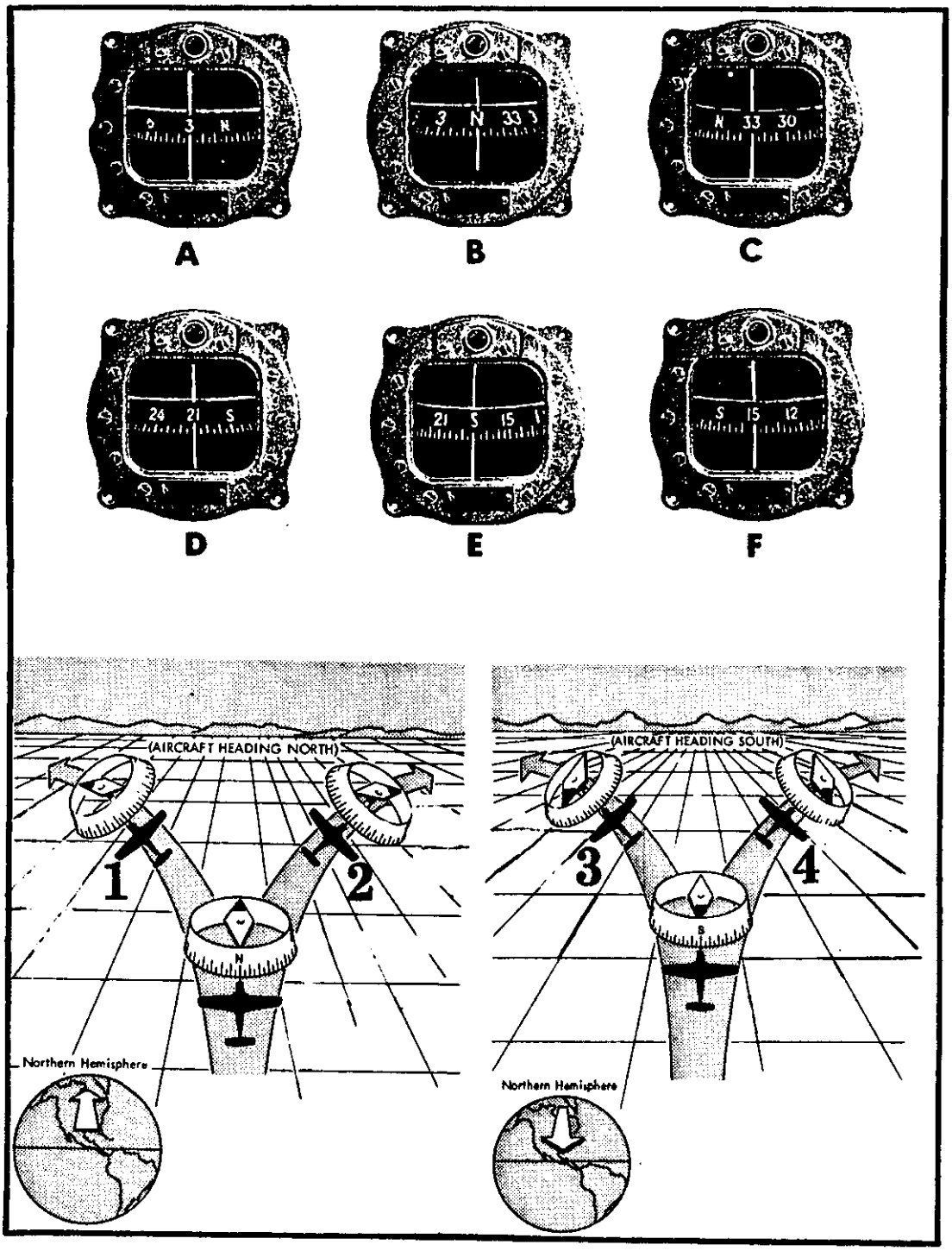
R09 1- presence of flaws in the permanent magnets of the compass.
2- the difference in the location between true north and magnetic north.
3- magnetic ore deposits in the earth distorting the lines of magnetic force.
4- magnetic fields within the airplane distorting the lines of magnetic force.

304. To level off from a climb to a specific altitude, the pilot should lead the level off by approximately

S02 1- 10 percent of the vertical speed.
2- 25 percent of the vertical speed.
3- 30 percent of the vertical speed.
4- 50 percent of the vertical speed.

305. Suppose a standard rate turn is maintained. How much time would be required to turn to the left from a heading of 090° to a heading of 300°?

S04 1- 30 seconds.
2- 40 seconds.
3- 50 seconds.
4- 1 minute.




306. Refer to the illustration above. Which of the compass indications shown would the pilots of airplanes 1 and 4, respectively, most likely observe as the airplane rolls into each of these turns?

R09 1- A and D.
2- A and F.
3- C and D.
4- C and F.

307. Refer to the illustration above. Which of the compass indications shown would the pilots of airplanes 2 and 3, respectively, most likely observe as the airplane rolls into each of these turns?

R09 1- A and D.
2- A and F.
3- C and D.
4- C and F.

308. The local altimeter setting should be used by all pilots in a particular area, primarily to provide for

R10 1- better vertical separation of aircraft.
2- more accurate terrain clearance in mountainous areas.
3- the elimination of the need to make in-flight calculations of true altitude.
4- the cancellation of altimeter error due to nonstandard temperatures aloft.

309. If the outside air temperature increases during a flight at constant power and at a constant indicated altitude, the true airspeed will

R11 1- increase and true altitude will decrease.
2- increase and true altitude will increase.
3- decrease and true altitude will decrease.
4- decrease and true altitude will increase.

310. As an airplane is rolled out of a 180° turn to straight-and-level flight on the attitude indicator, the aircraft will be in a

R12 1- slight turn to the right, and climbing slightly.
2- slight turn to the left and descending slightly.
3- slight skid to the right and climbing slightly.
4- slight slip to the left and descending slightly.

311. Except for T-tail designs, if an airplane is trimmed for level flight and power is increased, forward elevator pressure must be applied to maintain a constant altitude. The reason for the forward elevator pressure is primarily because of the

S03 1- increased downwash on the tail surface and increased lift.
2- added thrust which pulls the nose of the airplane upward.
3- decreased downwash on the tail surface which causes increased lift on the wings, forcing the nose of the airplane upward.
4- increased angle of attack and resulting additional lift which raises the nose of the airplane upward.

312. One characteristic that a properly functioning gyroscope depends upon for operation is the

R12 1- resistance to deflection of the spinning wheel or disc.
2- ability to resist precession 90° to any applied force.
3- position of the gyro base relative to the axis of the earth.
4- deflecting force developed from the angular velocity of the spinning wheel.

313. Rate of turn can be increased and radius of turn decreased by

S02 1- decreasing true airspeed and shallowing the bank.
2- decreasing true airspeed and increasing the bank.
3- increasing true airspeed and increasing the bank.
4- increasing true airspeed and decreasing the bank.

314. Approximately what percent of the indicated vertical speed should be used to determine the number of feet to lead the level off from a climb to a specific altitude?

S02 1- 10 percent.
2- 20 percent.
3- 25 percent.
4- 50 percent.

315. Except for T-tail designed airplanes, forward elevator control pressure is needed whenever power is added, because the

S03 1- downwash on the tail surface increases, therefore increasing lift.
2- decrease of lift on the wings caused by less downwash on the tail.
3- nose of the airplane is pulled upward due to the added thrust.
4- nose of the airplane raises due to the increased angle of attack and additional lift.

316. If a standard rate turn is maintained, how long would it take to turn 360°?

S04 1- 1 minute.
2- 2 minutes.
3- 3 minutes.
4- 4 minutes.

317. To level off from a high airspeed descent, the addition of power should be made, assuming a 500-FPM rate of descent, at approximately

S02 1- 50-100 feet above the desired altitude.
2- 100-150 feet above the desired altitude.
3- 150-200 feet above the desired altitude.
4- 200-250 feet above the desired altitude.

318. To level off from a descent maintaining the descending airspeed, the pilot should lead the desired altitude by approximately

S02 1- 20 feet.
2- 50 feet.
3- 60 feet.
4- 80 feet.

319. If a standard rate turn is maintained, how much time would be required to turn clockwise from a heading of 090° to a heading of 180°?

S04 1- 30 seconds.
2- 1 minute.
3- 1 minute 30 seconds.
4- 2 minutes.

320. Suppose a standard rate turn is maintained. How much time would be required to turn to the right from a heading of 090° to a heading of 270°?

S04 1- 1 minute.
2- 2 minutes.
3- 3 minutes.
4- 4 minutes.

321. While cruising at 160 knots you wish to establish a climb at 130 knots. When entering the climb (full panel) it is proper to make the initial pitch change by increasing back elevator pressure until the

S06 1- airspeed indication reaches 130 knots.
2- vertical speed indication reaches the predetermined rate of climb.
3- attitude indicator, airspeed, and vertical speed indicate a climb.
4- attitude indicator shows the approximate pitch attitude appropriate for the 130 knot climb.

322. If a standard rate turn is maintained, how long would it take to turn 180°?

S04 1- 1 minute.
2- 2 minutes.
3- 3 minutes.
4- 4 minutes.

323. While cruising at 190 knots you wish to establish a climb at 160 knots. When entering the climb (full panel) it would be proper to make the initial pitch change by increasing back elevator pressure until the

S06 1- airspeed indication reaches 160 knots.
2- vertical speed indication reaches the predetermined rate of climb.
3- attitude indicator, airspeed, and vertical speed indicate a climb.
4- attitude indicator shows the approximate pitch attitude appropriate for the 160 knot climb.

**Bank 20°**
**TAS 100 knots**

324. Suppose the airplane illustrated above is making a standard rate, constant altitude turn. To maintain this rate of turn and altitude, while increasing the airspeed to 130 knots, the angle of attack should be

S08 1- increased and the angle of bank decreased.
2- increased and the angle of bank increased.
3- decreased and the angle of bank increased.
4- decreased and the angle of bank decreased.

325. Which statement is true about "Standard Terminal Arrival Routes" (STARs)?

S12 1- The pilot in command must accept a STAR when issued by ATC.
2- STARs are used primarily by ATC to amend arrival clearances.
3- STAR clearances will not be issued unless requested by the pilot.
4- The use of STARs requires pilot possession of at least the approved textual description.

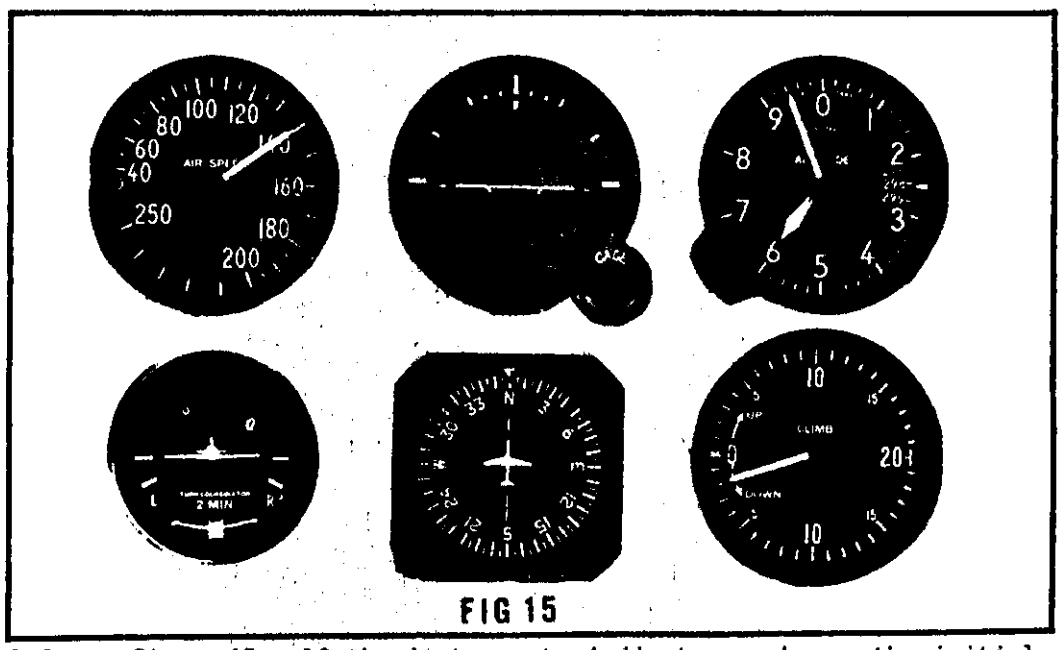



FIG 15

326. Refer to Figure 15. If the instruments indicate as shown, the initial correction to return to 6,000 feet while maintaining 140 knots should be to

S06 1- increase the pitch attitude and maintain the power setting.
2- maintain the pitch attitude and increase the power.
3- increase the pitch attitude and increase the power.
4- decrease the pitch attitude and increase the power.

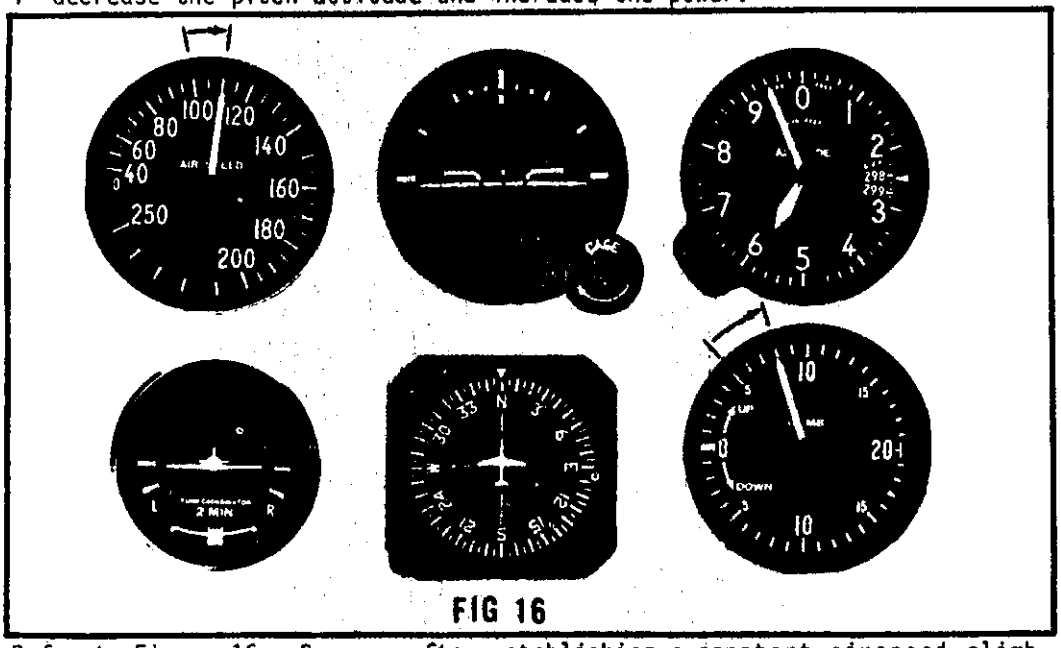


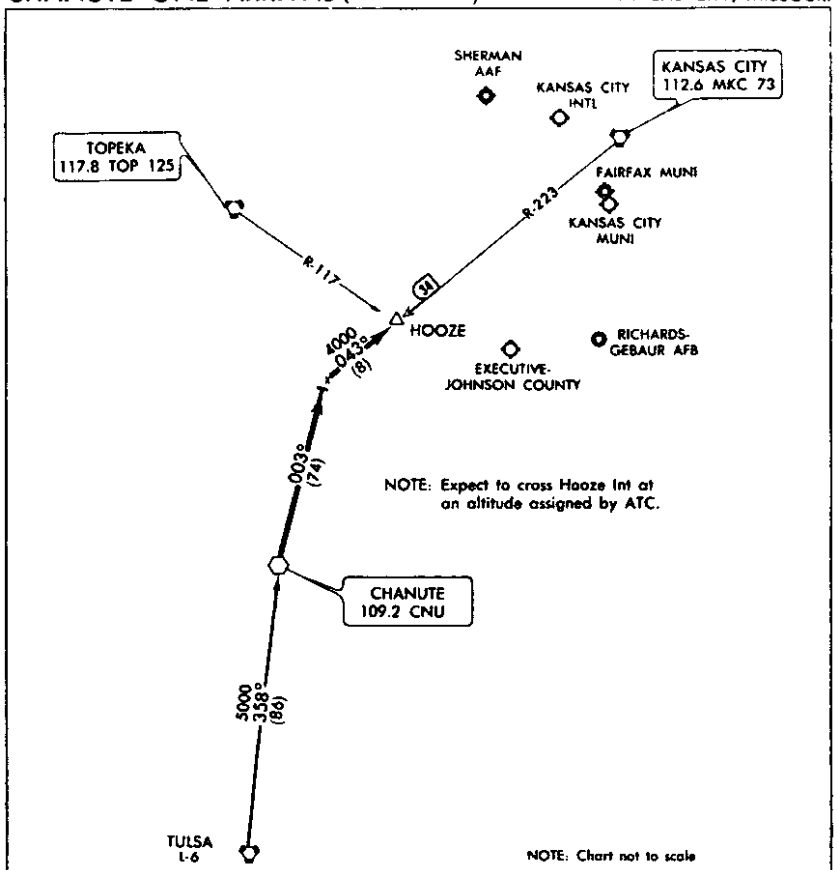

FIG 16

327. Refer to Figure 16. Suppose after establishing a constant-airspeed climb of 100 knots, and a constant rate of climb of 600 feet per minute, the instrument indications shown are observed. (Note: Arrows indicate direction and magnitude of movement.) The proper initial correction to reestablish the desired climb is

S06 1- an increase in power.
2- a decrease in pitch attitude.
3- a decrease in power.
4- an increase in power and a decrease in pitch attitude.

## CHANUTE ONE ARRIVAL (CNU.CNU1)

KANSAS CITY, MISSOURI




TULSA TRANSITION (TUL.CNU1): From over TULSA VORTAC via R-358 to CNU VOR. Thence . . . .

. . . . From over CNU VOR via R-003 and MKC R-223 to HOOZE INT, expect radar vector to final approach course.

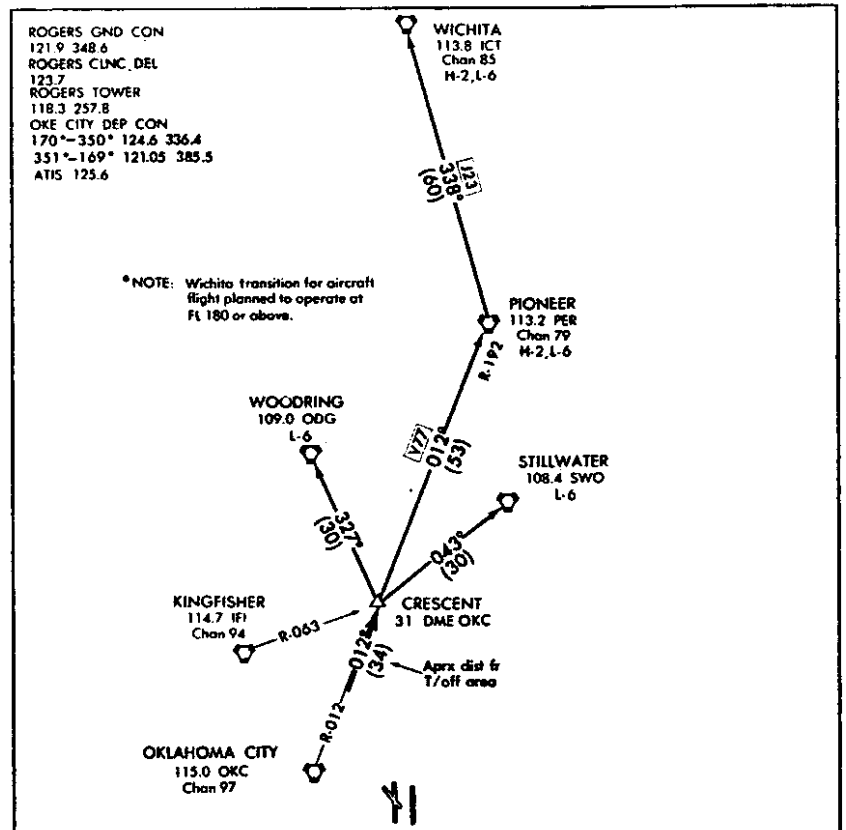
CHANUTE ONE ARRIVAL (CNU.CNU1)

KANSAS CITY, MISSOURI

FIG 17

## CRESCENT TWO DEPARTURE (8YC2.8YC)

WILL ROGERS WORLD
OKLAHOMA CITY, OKLAHOMA




**DEPARTURE ROUTE DESCRIPTION**

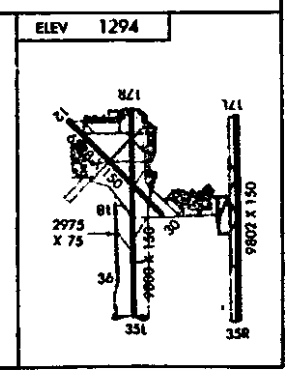
(Specified heading or routing) To intercept and proceed via the OKC R-012 to the CRESCENT INT. Then via (transition) or (assigned route). Maintain (altitude assigned by ATC).

PIONEER TRANSITION (8YC2.PER): Via the PER R-192 to the PER VORTAC.

STILLWATER TRANSITION (8YC2.SWO): Direct to the SWO VOR.

*WICHITA TRANSITION (8YC2.ICT): Via the PER R-192 to the PER VORTAC. Then via J23 to the ICT VORTAC.

WOODRING TRANSITION (8YC2.ODG): Direct to the ODG VOR.




CRESCENT TWO DEPARTURE (8YC2.8YC)

OKLAHOMA CITY, OKLAHOMA
WILL ROGERS WORLD

FIG 18

328. Refer to Fig. 17. You are cleared via the Chanute One Arrival, cruise 5,000. When may you descend to 4,000 feet?

S12 1- Immediately.
2- 74 NM past Chanute VOR.
3- Over the Chanute VOR.
4- Only when instructed by ATC.

329. Refer to Fig. 17, and consider the following:

Cruising altitude . . 9,000 feet
Route of flight . . . Tulsa Transition
Desired altitude . . 5,000 feet MSL
Rate of descent . . . 500 feet/minute
Groundspeed during descent . . . . . 180 knots

At what distance from the Tulsa VORTAC should the descent be started in order to arrive at the desired altitude 5 miles prior to reaching Chanute?

S12 1- 24 miles.
2- 57 miles.
3- 62 miles.
4- 68 miles.

330. Refer to Fig. 17, and consider the following:

Cruising altitude . . 11,000 feet
Route of flight . . . Tulsa Transition
Desired altitude . . 5,000 feet MSL
Rate of descent . . . 500 feet/minute
Groundspeed during descent . . . . . 150 knots

At what distance from the Tulsa VORTAC should the descent be started in order to arrive at the desired altitude 5 miles prior to reaching Chanute?

S12 1- 51 miles.
2- 56 miles.
3- 61 miles.
4- 66 miles.

331. Refer to Fig. 17. When flying the Chanute One Arrival, where is the VOR changeover point between Chanute and Kansas City?

S12 1- The 8 DME fix from Hooze.
2- The 74 DME fix from Chanute.
3- Half-way or the 50 DME fix from Chanute.
4- The intersection of the Chanute 003 radial and Kansas City 223 radial.

332. Refer to Fig. 18. A pilot desiring the Wichita Transition, should have planned the en route altitude to be at least

S12 1- 8,000 feet.
2- 9,000 feet.
3- 11,000 feet.
4- 18,000 feet.

333. Refer to Fig. 18. When flying the Wichita Transition, which Low Altitude En Route Chart would the pilot use for additional en route information?

S12 1- L-2.
2- L-4.
3- L-6.
4- L-8.

334. Refer to Fig. 18. When flying the Stillwater Transition, which Low Altitude En Route Chart would the pilot use for additional en route information?

S12 1- L-2.
2- L-4.
3- L-6.
4- L-8.

335. Refer to Fig. 18. When requesting the Wichita Transition, a pilot should expect to be assigned which cruising altitude?

S12 1- 10,000 feet or below.
2- At least 15,000 feet, but less than 18,000 feet.
4- 18,000 feet or above.
3- Any altitude below 18,000 feet.

336. Is an NDB instrument approach authorized to an airport under the following conditions?

A. Surveillance radar is available.
B. The missed approach procedure uses a VOR holding fix.
C. The aircraft equipment consists of only one ADF and one two-way radio (no VOR receiver).

S16 1- No, because a VOR receiver is required for the missed approach procedure.
2- Yes, since radar vectoring is available.
3- Yes, since a VOR receiver is not required for the approach.
4- Yes, but 1,000 feet and 1 mile visibility must be added to the approach minimums.

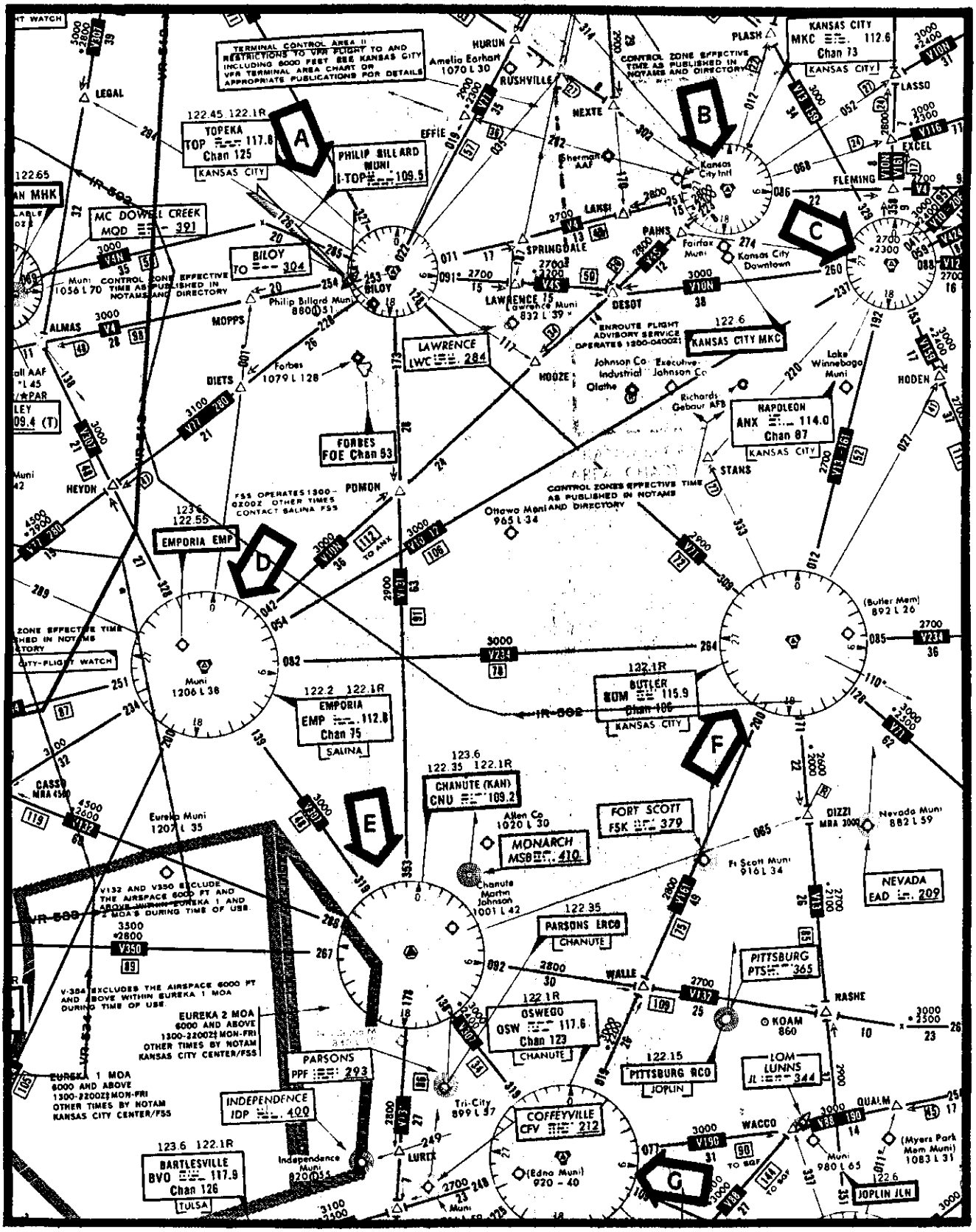

TERMINAL CONTROL AREA II
RESTRICTIONS TO VFR FLIGHT TO AND INCLUDING 6000 FEET SEE KANSAS CITY VFR TERMINAL AREA CHART OR APPROPRIATE PUBLICATIONS FOR DETAILS
122.45 122.1R
TOPEKA
TOP 117.8
Chan 125
KANSAS CITY
PHILIP BILLARD MUNI
TOP 109.6
A
B
C
D
E
F
G
LEGAL
HURUN
Amelia Earhart
1070 L 30
RUSHVILLE
NEXTE
EFFIE
Sherman AAF
Kansas City Intl
PLASH
KANSAS CITY
MKC 112.6
Chan 73
KANSAS CITY
LASSO
EXCEL
FLEMING
LARSH
SPRINGDALE
PAINS
Fairfax Muni
Kansas City Downtown
MC DOWELL CREEK
MQD 391
BILOY
TO 304
BILOY
Philip Billard Muni
8800 L 31
LAWRENCE 15
Lawrence Muni
832 L 39
DESOT
ENROUTE FLIGHT ADVISORY SERVICE OPERATES 1300-0400Z‡
122.6
KANSAS CITY MKC
ALMAS
MOPPS
DIETS
Forbes
1079 L 128
LAWRENCE
LWC 284
HOOZE
Johnson Co Executive-Industrial
Johnson Co
Olathe
Richards Gebaur AFB
Lake Winnebago Muni
HODEN
NAPOLEON
ANX 114.0
Chan 87
KANSAS CITY
STANS
HEYDON
FORBES
FOE Chan 53
POMON
FSS OPERATES 1300-0200Z OTHER TIMES CONTACT SALINA FSS
Ottawa Mem
965 L 34
EMPORIA EMP
122.55
112 TO ANX
Muni
1206 L 36
122.2 122.1R
EMPORIA
EMP 112.8
Chan 75
SALINA
122.1R
BUTLER
EDM 115.9
Chan 106
KANSAS CITY
(Butler Mem)
892 L 26
123.6
122.35 122.1R
CHANUTE (KAN)
CNU 109.2
Allen Co
1020 L 30
FORT SCOTT
FSK 379
MONARCH
MSB 410
Chanute Martin Johnson
1001 L 42
Ft Scott Muni
916 L 34
DIZZI
MRA 3000
Nevada Muni
882 L 59
NEVADA
EAD 209
Eureka Muni
1207 L 35
CASSO
MRA 4500
V132 AND V350 EXCLUDE THE AIRSPACE 6000 FT AND ABOVE WITHIN EUREKA 1 AND 2 MOA'S DURING TIME OF USE
V-384 EXCLUDES THE AIRSPACE 6000 FT AND ABOVE WITHIN EUREKA 1 MOA DURING TIME OF USE
EUREKA 2 MOA
6000 AND ABOVE
1300-2200Z‡ MON-FRI
OTHER TIMES BY NOTAM
KANSAS CITY CENTER/FSS
EUREKA 1 MOA
6000 AND ABOVE
1300-2200Z‡ MON-FRI
OTHER TIMES BY NOTAM
KANSAS CITY CENTER/FSS
PARSONS ERCO
CHANUTE
PARSONS
PPF 293
OSWEGO
OSW 117.6
Chan 123
CHANUTE
PITTSBURG
PTS 365
PITTSBURG RCO
JOPLIN
LOM
LUNNS
JL 344
KOAM
860
RASHE
WALLE
INDEPENDENCE
IDP 400
Tri-City
899 L 37
COFFEYVILLE
CFV 212
(Edna Muni)
920 - 40
WACCO
TO SGF
QUAIM
(Myers Park Mem Muni)
1083 L 31
Muni
980 L 65
JOPLIN JLN
122.6
123.6 122.1R
BARTLESVILLE
BVO 117.9
Chan 126
TULSA
Independence Muni
820 L 35
LURIE

**FIG-19**

337. Refer to Fig. 19, and consider the following:

| | |
|---|---|
| Route . . . . . | Emporia VORTAC (D) via V10N, V4S to Kansas City VORTAC (B) |
| Over EMP VORTAC . . | 1203 CST |
| Over Pomon Intersection . . | 1217 and 30 sec CST |

Based on this information, your ETA over Kansas City (B) VORTAC would be approximately

S13 1- 1241 CST.
2- 1248 CST.
3- 1252 CST.
4- 1258 CST.

338. Refer to Fig. 19. What is the lowest altitude that will assure adequate DME signals to identify Dizzi Intersection south of Butler VORTAC (F) on V13?

S13 1- 2,000 feet.
2- 2,600 feet.
3- 2,700 feet.
4- 3,000 feet.

339. Refer to Fig. 19, and consider the following:

| | |
|---|---|
| Route . . . . . | Emporia VORTAC (D) via V10N, V4S to Kansas City VORTAC (B) |
| Over EMP VORTAC . . | 1305 CDT |
| Over VOR Changeover Pt . . | 1329 CDT |

Based on this information, your ETA over the Kansas City VORTAC would be approximately

S13 1- 1350 CDT.
2- 1353 CDT.
3- 1356 CDT.
4- 1359 CDT.

340. Refer to Fig. 19. On what frequency should you contact "Kansas City Flight Watch"?

S13 1- 122.0
2- 122.1R and 112.6T
3- 122.6
4- 123.6

341. Refer to Fig. 19, and consider the following:

| | |
|---|---|
| Route of flight . . | Butler VORTAC (F), VIA V161 to Oswego (G) |
| No. 1 NAV . . . . . | Butler VORTAC, OBS set on 200° |
| No. 2 NAV . . . . . | Chanute VORTAC, OBS set on 092° |

If the CDIs of <u>both</u> receivers have full-scale deflections to the right, the airplane has

S13 1- passed Walle Intersection and is east of V161.
2- passed Walle Intersection and is west of V161.
3- not passed Walle Intersection and is east of V161.
4- not passed Walle Intersection and is west of V161.

342. Refer to Fig. 19. What is the lowest MEA on V161 between Butler VORTAC (F) and Oswego VORTAC (G)?

S13 1- 2,200 feet.
2- 2,500 feet.
3- 2,800 feet.
4- 3,000 feet.

343. Refer to Fig. 19. What is the MEA on V10N between Hooze Intersection and Desot Intersection (D-B)?

S13 1- 2,000 feet.
2- 2,300 feet.
3- 2,800 feet.
4- 3,000 feet.

344. Refer to Fig. 19. What is the MOCA on V10N between Hooze Intersection and Desot Intersection (D-B)?

S13 1- 2,000 feet.
2- 2,300 feet.
3- 2,800 feet.
4- 3,000 feet.

345. Refer to Fig. 19. What is the MEA on V10N northbound from Napoleon VORTAC (C)?

S13 1- 2,300 feet.
2- 2,500 feet.
3- 2,700 feet.
4- 2,800 feet.

FIG 20

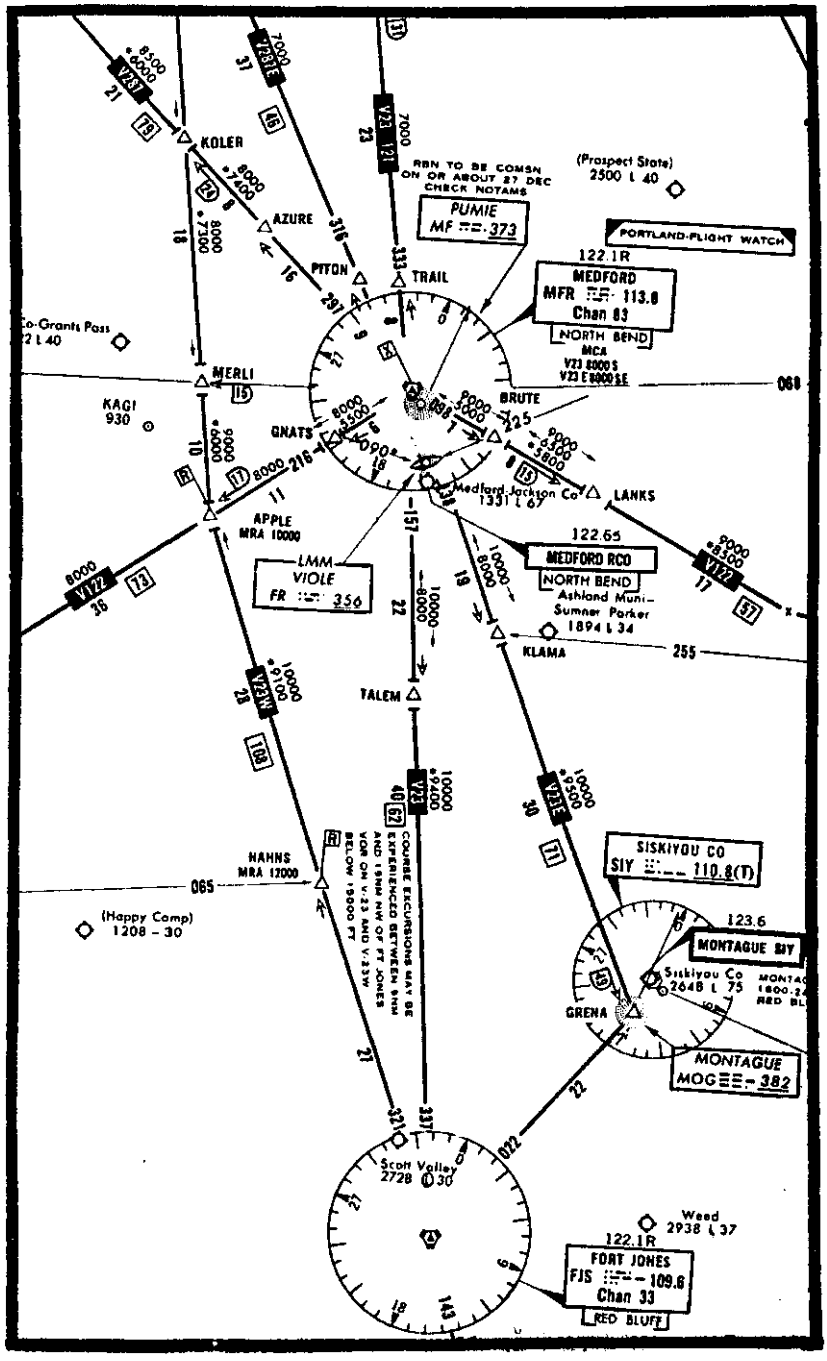
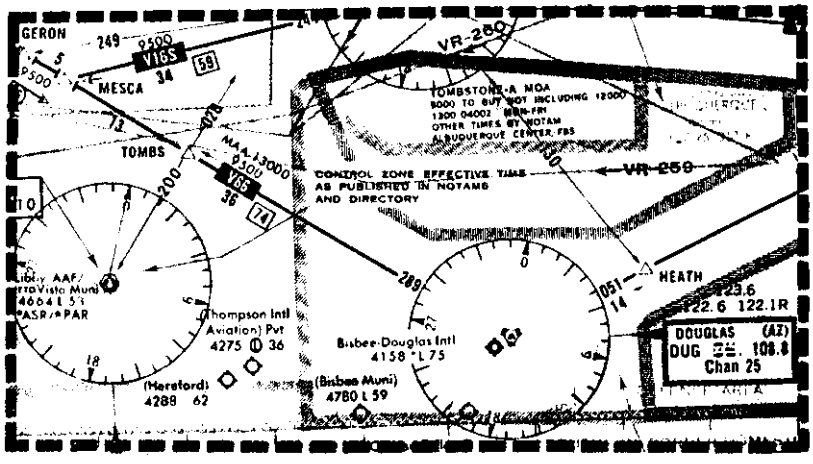

KOLER
AZURE
PYTON
TRAIL
PUMIE
MF 373
RBN TO BE COMSN ON OR ABOUT 27 DEC CHECK NOTAMS
(Prospect State) 2500 L 40
PORTLAND-FLIGHT WATCH
122.1R
MEDFORD
MFR 113.8
Chan 83
NORTH BEND
MCA V23 8000 S V23 E 8000 SE
MERLI
KAGI 930
GNATS
BRUTE
APPLE MRA 10000
LMM VIOLE FR 356
Medford-Jackson Co 1331 L 67
LANKS
122.65
MEDFORD RCO
NORTH BEND
Ashland Muni-Sumner Parker 1894 L 34
KLAMA
TALEM
HAHNS MRA 12000
(Happy Camp) 1208 - 30
SISKIYOU CO
SIY 110.8(T)
123.6
MONTAGUE SIY
Siskiyou Co 2648 L 75
GRENA
MONTAGUE
MOG 382
Scott Valley 2728
Weed 2938 L 37
122.1R
FORT JONES
FJS 109.6
Chan 33
RED BLUFF

FIG 21


GERON
MESCA
TOMBS
VR-260
TOMBSTONE-A MOA
CONTROL ZONE EFFECTIVE TIME AS PUBLISHED IN NOTAMS AND DIRECTORY
HEATH
123.6
122.6 122.1R
DOUGLAS (AZ)
DUG 108.8
Chan 25
Bisbee-Douglas Intl 4158 L 75
(Bisbee Muni) 4780 L 59
(Hereford) 4289 62
(Thompson Intl Aviation) Pvt 4275 36

346. What is the lowest altitude a northwest bound flight on V23W should be able to identify Hahns Intersection? The DME is operative. (Figure 20).

S13 1- 9,100 feet.
2- 9,400 feet.
3- 10,000 feet.
4- 12,000 feet.

347. Refer to Fig. 20. What is the MOCA from Fort Jones VORTAC to Hahns Intersection on V23W?

S13 1- 6,000 feet.
2- 9,100 feet.
3- 10,000 feet.
4- 12,000 feet.

348. Refer to Fig. 20. The MEA when inbound to the Medford VORTAC and between Lanks and Brute Intersection is

S13 1- 5,000 feet.
2- 5,800 feet.
3- 6,500 feet.
4- 9,000 feet.

349. Refer to Fig. 20. On an IFR southbound flight via V23, the minimum crossing altitude at Medford VORTAC is

S13 1- 7,000 feet.
2- 8,000 feet.
3- 9,400 feet.
4- 10,000 feet.

350. Refer to Fig. 20. What is the minimum altitude which will assure acceptable navigational signal reception on V122 from Lanks to Brute?

S13 1- 5,000 feet.
2- 5,800 feet.
3- 6,500 feet.
4- 9,000 feet.

351. Refer to Fig. 20. Unless equipped with DME, a flight on V122 may not be able to determine Apple Intersection at an altitude below

S13 1- 6,000 feet.
2- 8,000 feet.
3- 9,000 feet.
4- 10,000 feet.

352. Refer to Fig. 21. What is the maximum altitude for a flight on V66 between Douglas VORTAC and Mesca Intersection?

S13 1- 9,000 feet.
2- 9,500 feet.
3- 10,000 feet.
4- 13,000 feet.

353. Which statement is true concerning a Visual Descent Point (VDP), as incorporated in selected nonprecision straight-in procedures?

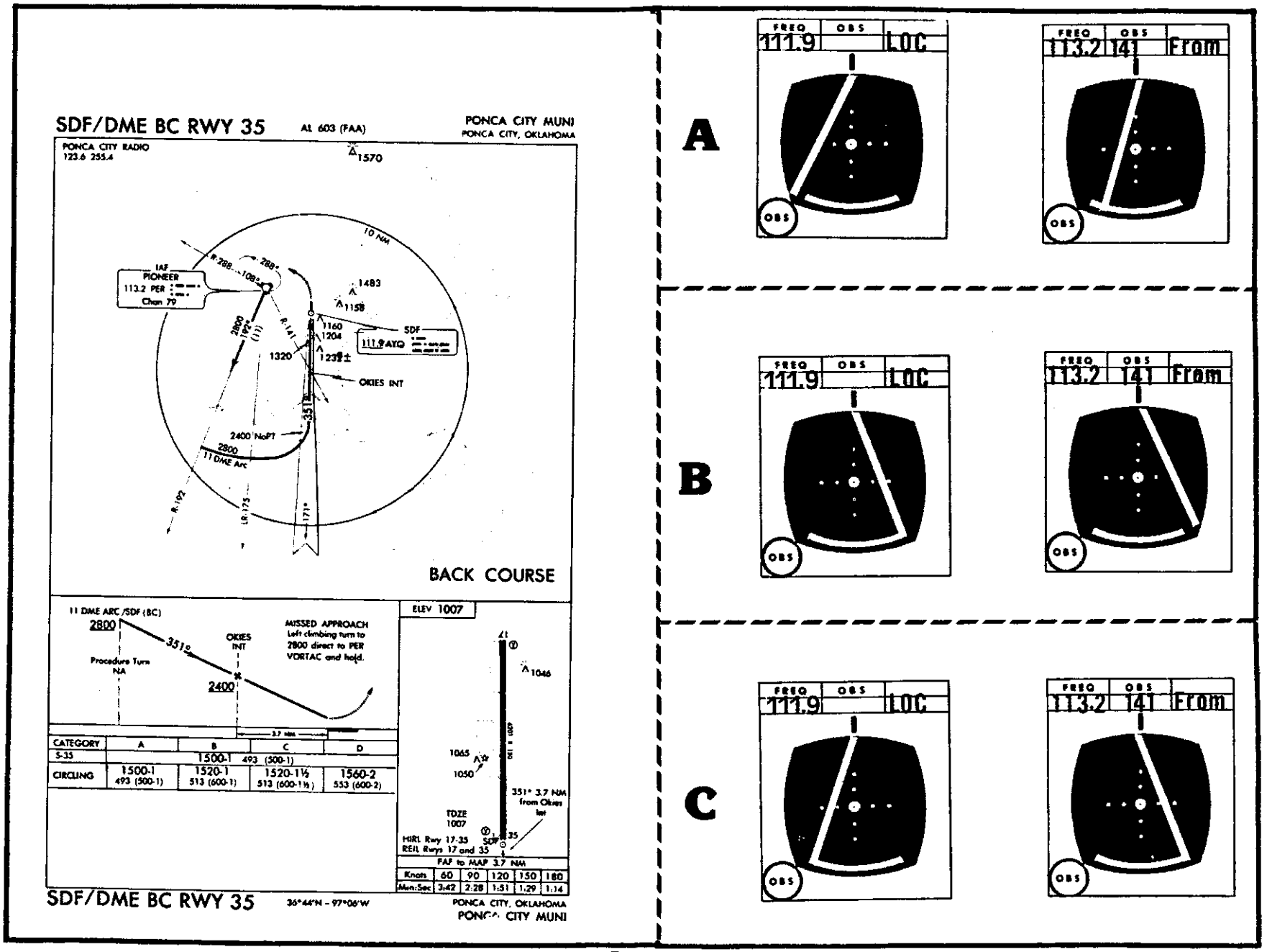
S14 1- The pilot should not descend below the MDA prior to reaching the VDP.
2- The pilot may descend to the VDP altitude prior to reaching the final approach fix.
3- Where established the VDP is a mandatory part of the procedure.
4- In an attempt to establish visual contact, the pilot may descend to the VDP which is 50 feet below the published minimums.

354. One significant difference between an SDF approach and an ILS approach procedure is that the

S14 1- SDF fan markers transmit on 150 MHz instead of 75 MHz.
2- SDF course may be wider and offset from the runway centerline.
3- identification signal of the SDF is prefixed with an "S" instead of "I" as for the ILS.
4- landing minimums are generally lower for the SDF due to greater precision of the equipment.

355. When tracking inbound on the localizer, which of the following is the proper procedure regarding drift corrections?

S17 1- Drift corrections should be made in 5° increments after passing the outer marker.
2- Drift corrections should be made in 10° increments after passing the outer marker.
3- Drift corrections should be made in more than 5° increments after passing the outer marker.
4- Drift corrections should be accurately established before reaching the outer marker, and completion of the approach should be accomplished with heading corrections no greater than 2°.


SDF/DME BC RWY 35
AL 603 (FAA)
PONCA CITY MUNI
PONCA CITY, OKLAHOMA
PONCA CITY RADIO
123.6 255.4
1570
10 NM
IAF
PIONEER
113.2 PER
Chan 79
R-288
288°
108°
1483
1158
1160
1204
SDF
111.9 AYQ
2800
1320
1239±
OKIES INT
R-141
351°
2400 NoPT
2800
11 DME Arc
R-192
R-175
171°
BACK COURSE
11 DME ARC/SDF (BC)
2800
351°
OKIES INT
2400
Procedure Turn NA
MISSED APPROACH
Left climbing turn to 2800 direct to PER VORTAC and hold.
3.7 NM
ELEV 1007
1046
1065
1050
TDZE 1007
HIRL Rwy 17-35
REIL Rwys 17 and 35
351° 3.7 NM from Okies Int
FAF to MAP 3.7 NM
Knots 60 90 120 150 180
Min:Sec 3:42 2:28 1:51 1:29 1:14
CATEGORY A B C D
S-35 1500-1 493 (500-1)
CIRCLING 1500-1 493 (500-1) 1520-1 513 (600-1) 1520-1½ 513 (600-1½) 1560-2 553 (600-2)
SDF/DME BC RWY 35
36°44'N - 97°06'W
PONCA CITY, OKLAHOMA
PONCA CITY MUNI
A
FREQ OBS
111.9 LOC
OBS
FREQ OBS
113.2 141 From
OBS
B
FREQ OBS
111.9 LOC
OBS
FREQ OBS
113.2 141 From
OBS
C
FREQ OBS
111.9 LOC
OBS
FREQ OBS
113.2 141 From
OBS

FIG—22

356. Refer to Fig. 22, and Instrument group A. If reverse sensing equipment is not available, what is the position of this aircraft on final approach of the SDF/DME BC RWY 35 at Ponca City?

S14 1- Left of course and past OKIES Intersection.
2- Left of course and approaching OKIES Intersection.
3- Right of course and past OKIES Intersection.
4- Right of course and approaching OKIES Intersection.

357. Refer to Fig. 22, and Instrument group B. If reverse sensing equipment is not available, what is the position of this aircraft on final approach of the SDF/DME RWY 35 at Ponca City?

S14 1- Right of course and approaching OKIES Intersection.
2- Right of course and past OKIES Intersection.
3- Left of course and approaching OKIES Intersection.
4- Left of course and past OKIES Intersection.

358. Refer to Fig. 22, and Instrument group C. If reverse sensing equipment is not available, what is the position of this aircraft on final approach of the SDF/DME BC RWY 35 at Ponca City?

S14 1- Left of course and past OKIES Intersection.
2- Left of course and approaching OKIES Intersection.
3- Right of course and past OKIES Intersection.
4- Right of course and approaching OKIES Intersection.

359. Concerning "Standard Terminal Arrival Routes" (STARs), which statement is correct?

S12 1- When ATC deems it appropriate a STAR may be issued to any civil IFR flight.
2- STAR clearances will not be issued unless requested by the pilot.
3- STARs are published for all airports having a standard instrument approach procedure.
4- Before ATC will issue a STAR, the destination airport must have two or more published instrument approach procedures.

360. Refer to Fig. 22. While holding at PER a pilot receives this clearance excerpt:

"34X IS CLEARED FOR THE SDF/DME BC RWY 35 APPROACH, REPORT PASSING OKIES INTERSECTION."

To comply, the pilot should depart the holding pattern via the

S14 1- PER R-192; intercept the PER 11 DME ARC; intercept the SDF course inbound; report passing OKIES Intersection.
2- PER R-192; intercept the SDF 11 DME ARC; intercept the SDF course inbound; report passing OKIES Intersection.
3- PER R-175; intercept the SDF 11 DME ARC; intercept the SDF course inbound; report passing OKIES Intersection.
4- PER R-141; intercept the SDF course outbound and execute a procedure turn within 11 DME of SDF; report passing OKIES Intersection inbound.

361. Unless higher minimums are specified, the standard IFR alternate minimums for a precision approach procedure are

S14 1- ceiling 600 feet and visibility 2 miles.
2- ceiling 800 feet and visibility 2 miles.
3- ceiling 1,000 feet and visibility 1 mile.
4- ceiling 1,000 feet and visibility 2 miles.

362. Concerning side-step maneuvering minimums, which of the following is a correct statement?

S17 1- Landing minimums for a side-step maneuver to the adjacent runway will be higher than the minima to the primary runway, but will normally be lower than the published circling minima.
2- Landing minimums for a side-step maneuver to the adjacent runway will be lower than the minima to the primary runway, but will normally be higher than the published circling minima.
3- Circling minimums for the primary runway are established as the minima to be used by the pilot executing a side-step maneuver.
4- Straight-in LOC minimums for the primary runway are established as the minima to be used by the pilot executing a side-step maneuver.

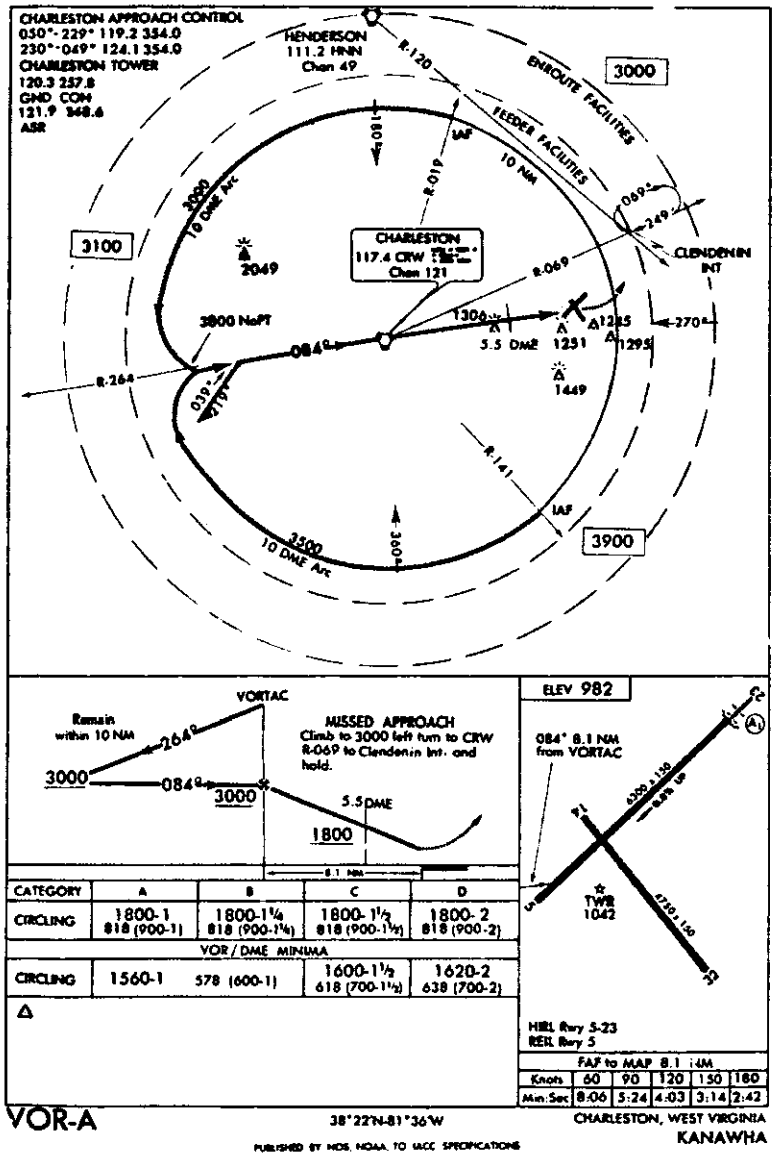

VOR A
AL- 852 (FAA)
CHARLESTO
EST VIRGINIA
CHARLESTON APPROACH CONTROL
050°-229° 119.2 354.0
230°-049° 124.1 354.0
CHARLESTON TOWER
120.3 257.8
GND CON
121.9 348.6
ASR
HENDERSON
111.2 HNN
Chan 49
R-120
ENROUTE FACILITIES
3000
FEEDER FACILITIES
180°
IAF
R-019
10 NM
3000
10 DME Arc
3100
2049
CHARLESTON
117.4 CRW
Chan 121
R-069
069°
249°
CLENDENIN
INT
3800 NoPT
084°
1306
5.5 DME
1251
1285
1295
270°
1449
R-264
039°
219°
R-141
IAF
3600
3500
10 DME Arc
3900
Remain
within 10 NM
VORTAC
264°
3000
084°
3000
MISSED APPROACH
Climb to 3000 left turn to CRW
R-069 to Clendenin Int. and
hold.
5.5 DME
1800
8.1 NM
ELEV 982
084° 8.1 NM
from VORTAC
6300 x 150
8479 Lgt
TWR
1042
4750 x 150
HIRL Rwy 5-23
REIL Rwy 5
FAF to MAP 8.1 NM
Knots 60 90 120 150 180
Min:Sec 8:06 5:24 4:03 3:14 2:42
CATEGORY A B C D
CIRCLING 1800-1 818 (900-1) 1800-1¼ 818 (900-1¼) 1800-1½ 818 (900-1½) 1800-2 818 (900-2)
VOR/DME MINIMA
CIRCLING 1560-1 578 (600-1) 1600-1½ 618 (700-1½) 1620-2 638 (700-2)
VOR-A
38°22'N-81°36'W
CHARLESTON, WEST VIRGINIA
KANAWHA
PUBLISHED BY NOS, NOAA, TO IACC SPECIFICATIONS

FIG. 23

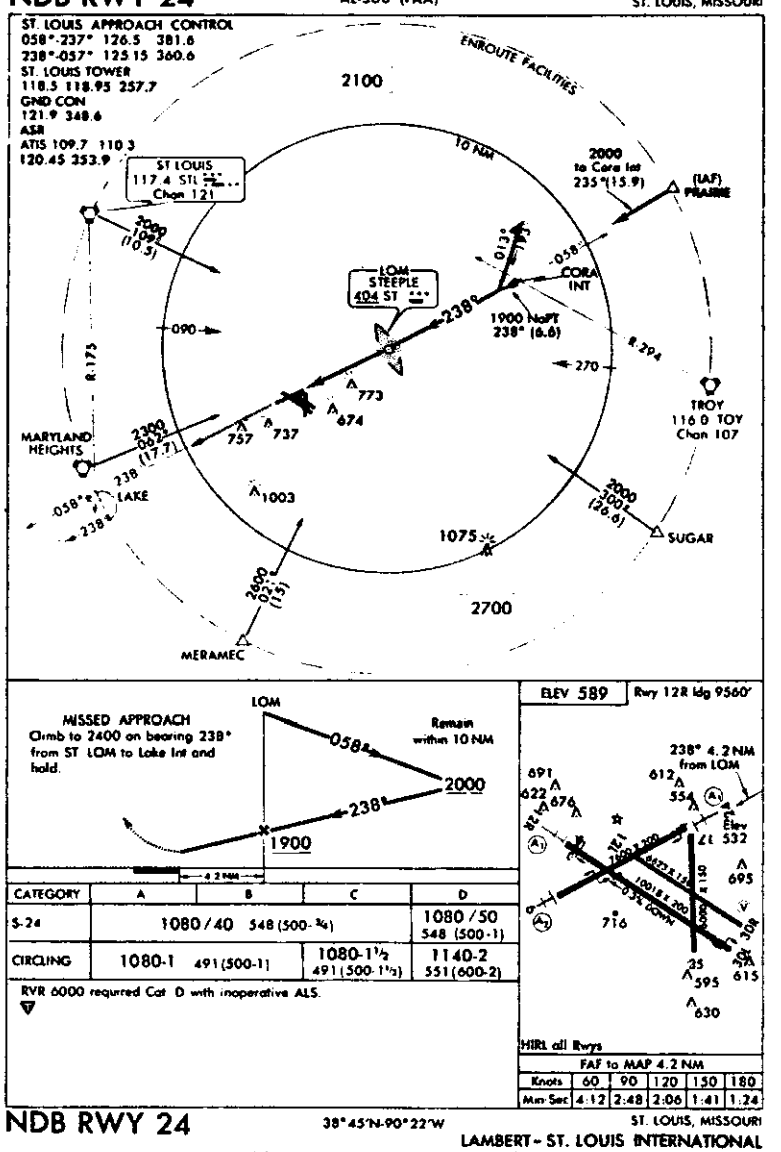

NDB RWY 24
AL-360 (FAA)
ST. LOUIS, MISSOURI
ST. LOUIS APPROACH CONTROL
058°-237° 126.5 381.6
238°-057° 125.15 360.6
ST. LOUIS TOWER
118.5 118.95 257.7
GND CON
121.9 348.6
ASR
ATIS 109.7 110.3
120.45 253.9
ENROUTE FACILITIES
2100
10 NM
ST LOUIS
117.4 STL
Chan 121
2000
to Cora Int
235°(15.9)
(IAF)
PRAIRIE
LOM
STEEPLE
404 ST
013°
193°
058°
CORA
INT
238°
1900 NoPT
238° (6.6)
090°
270°
R-173
R-294
773
674
757
737
MARYLAND
HEIGHTS
2300
0622
(17.7)
238°
058°
238°
LAKE
1003
1075
TROY
116.0 TOY
Chan 107
2000
3001
(26.6)
SUGAR
2700
2600
021°
(15)
MERAMEC
MISSED APPROACH
Climb to 2400 on bearing 238°
from ST LOM to Lake Int and
hold.
LOM
058°
Remain
within 10 NM
2000
238°
1900
4.2 NM
ELEV 589
Rwy 12R ldg 9560'
238° 4.2 NM
from LOM
691
622
676
612
554
Elev
532
695
716
35
595
615
630
3.0% DOWN
HIRL all Rwys
FAF to MAP 4.2 NM
Knots 60 90 120 150 180
Min:Sec 4:12 2:48 2:06 1:41 1:24
CATEGORY A B C D
S-24 1080/40 548 (500-¾) 1080/50 548 (500-1)
CIRCLING 1080-1 491 (500-1) 1080-1½ 491 (500-1½) 1140-2 551 (600-2)
RVR 6000 required Cat D with inoperative ALS.
NDB RWY 24
38°45'N-90°22'W
ST. LOUIS, MISSOURI
LAMBERT-ST. LOUIS INTERNATIONAL
PUBLISHED BY NOS, NOAA, TO IACC SPECIFICATIONS

FIG. 24

363. Refer to Fig. 23. What is the function of the 5.5 DME fix on the VOR-A approach at Kanawha Airport?

S15 1- A missed approach point if the DME is inoperable.
2- A step down fix which, if identified, permits a lower MDA.
3- A fix where the pilot may descend below the MDA if the runway environment is visible.
4- A fix from which a pilot may execute a straight-in to RWY 5 if the runway environment is visible.

364. Refer to Fig. 23. Which of the following is true regarding your IFR flight plan, upon completing the VOR-A approach at Kanawha?

S15 1- You should contact the Charleston FSS and request the flight plan be closed.
2- The tower will automatically close your flight plan when you have landed.
3- You should contact the ARTCC on the last assigned frequency and request the flight plan be closed.
4- The ARTCC will automatically close the flight plan after you are handed off to the tower.

365. Refer to Fig. 23. Consider an airplane in a no-wind condition, inbound on the 019 radial, and at a groundspeed of 130 knots. If the pilot is cleared for the approach via the 10 DME ARC, the first turn to intercept the ARC should be to a heading of

S15 1- 084° when the DME indicates 1.05 NM.
2- 109° when the DME indicates 11.0 NM.
3- 199° when the DME indicates 11.5 NM.
4- 289° when the DME indicates 10.5 NM.

366. Refer to Fig. 24. When should a pilot begin the missed approach on the NDB RWY 24 Circling approach at Lambert-St. Louis, if visual contact is not established?

S16 1- Upon expiration of the time specified for the groundspeed.
2- Upon arrival over the runway threshold.
3- When arriving at 1,080 feet on the descent from the FAF.
4- When the ADF needle indicates a bearing of 238° after passing the FAF inbound.

367. Refer to Fig. 23. The MAP for the VOR-A approach using DME to Kanawha should be based on the time of arrival at

S15 1- the CRW VORTAC.
2- 8.1 NM past the CRW VORTAC.
3- 1,800 feet after passing the CRW VORTAC.
4- the 5.5 DME fix after passing the CRW VORTAC.

368. Refer to Fig. 23, and consider the note "Remain within 10 NM." This indicates that the pilot should remain within 10 NM of

S15 1- the 10 DME arc while completing the procedure turn.
2- the Kanawha airport throughout the approach.
3- CRW VORTAC while completing the procedure turn.
4- the 264° inbound course to the CRW VORTAC while completing the procedure turn.

369. Refer to Fig. 23. After being "cleared for approach" at the intersection of the 10 DME ARC and R-141 of the CRW VORTAC, what is the minimum altitude to which a pilot may immediately descend?

S15 1- 3,000 feet.
2- 3,100 feet.
3- 3,500 feet.
4- 3,900 feet.

370. Refer to Fig. 24. Consider an airplane which is cleared to intercept the final approach course inbound via the 294 radial of the TROY VORTAC. What would a fixed card ADF indicate upon arrival at CORA Intersection in a no-wind condition?

S16 1- 238°.
2- 304°.
3- 339°.
4- 360°.

371. To ensure proper airspace protection while in a holding pattern, what is the recommended maximum indicated airspeed above 14,000 feet?

S22 1- 200 knots.
2- 210 knots.
3- 220 knots.
4- 230 knots.

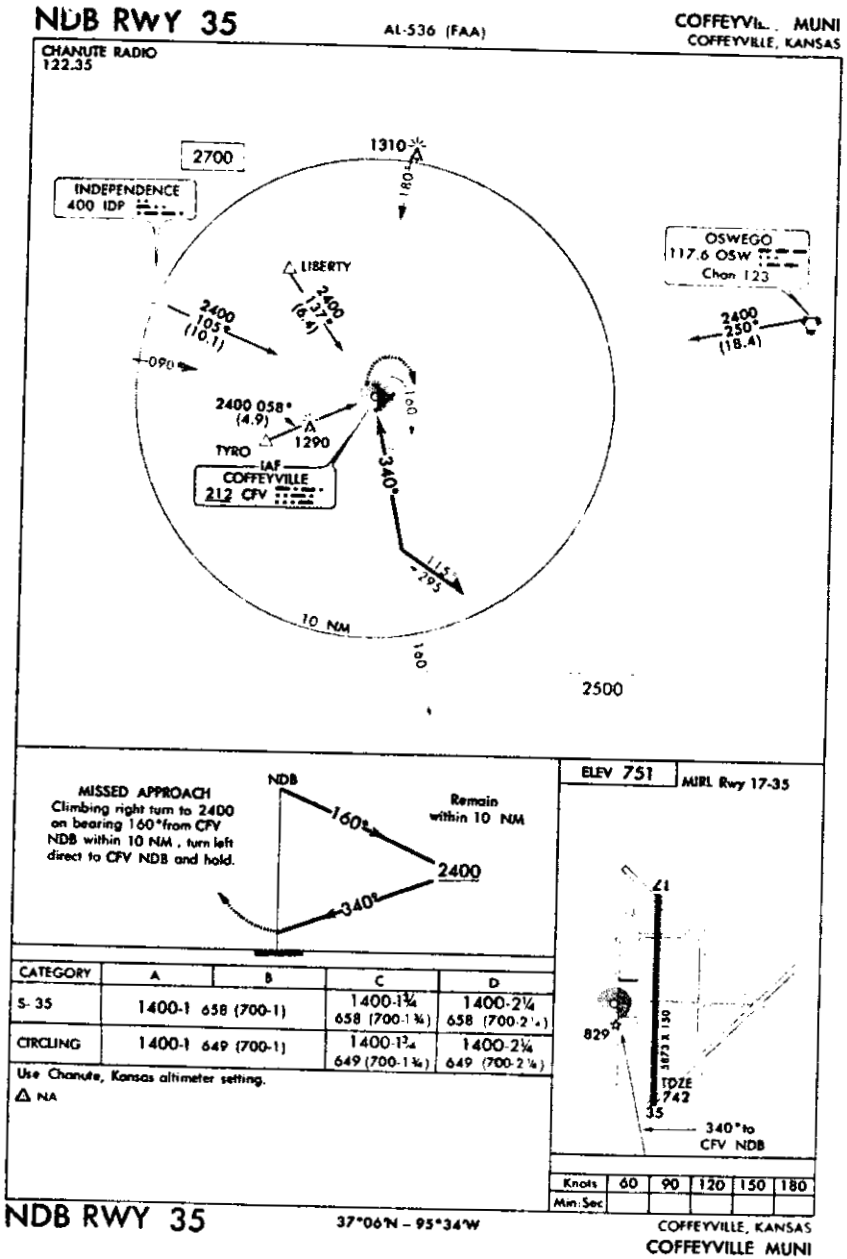

NDB RWY 35
AL-536 (FAA)
COFFEYVILLE MUNI
COFFEYVILLE, KANSAS
CHANUTE RADIO
122.35
2700
1310
INDEPENDENCE
400 IDP
LIBERTY
2400
105°
(10.1)
2400
137°
(8.4)
OSWEGO
117.6 OSW
Chan 123
2400
250°
(18.4)
090
180
2400 058°
(4.9)
TYRO
1290
IAF
COFFEYVILLE
212 CFV
340°
115°
295°
10 NM
2500
MISSED APPROACH
Climbing right turn to 2400 on bearing 160° from CFV NDB within 10 NM, turn left direct to CFV NDB and hold.
NDB
160°
340°
2400
Remain within 10 NM
ELEV 751
MIRL Rwy 17-35
829
3875 X 150
TDZE
742
17
35
340° to CFV NDB
CATEGORY | A | B | C | D
S-35 | 1400-1 658 (700-1) | | 1400-1¾ 658 (700-1¾) | 1400-2¼ 658 (700-2¼)
CIRCLING | 1400-1 649 (700-1) | | 1400-1¾ 649 (700-1¾) | 1400-2¼ 649 (700-2¼)
Use Chanute, Kansas altimeter setting.
△ NA
Knots | 60 | 90 | 120 | 150 | 180
Min:Sec
NDB RWY 35
37°06'N – 95°34'W
COFFEYVILLE, KANSAS
COFFEYVILLE MUNI

FIG. 25

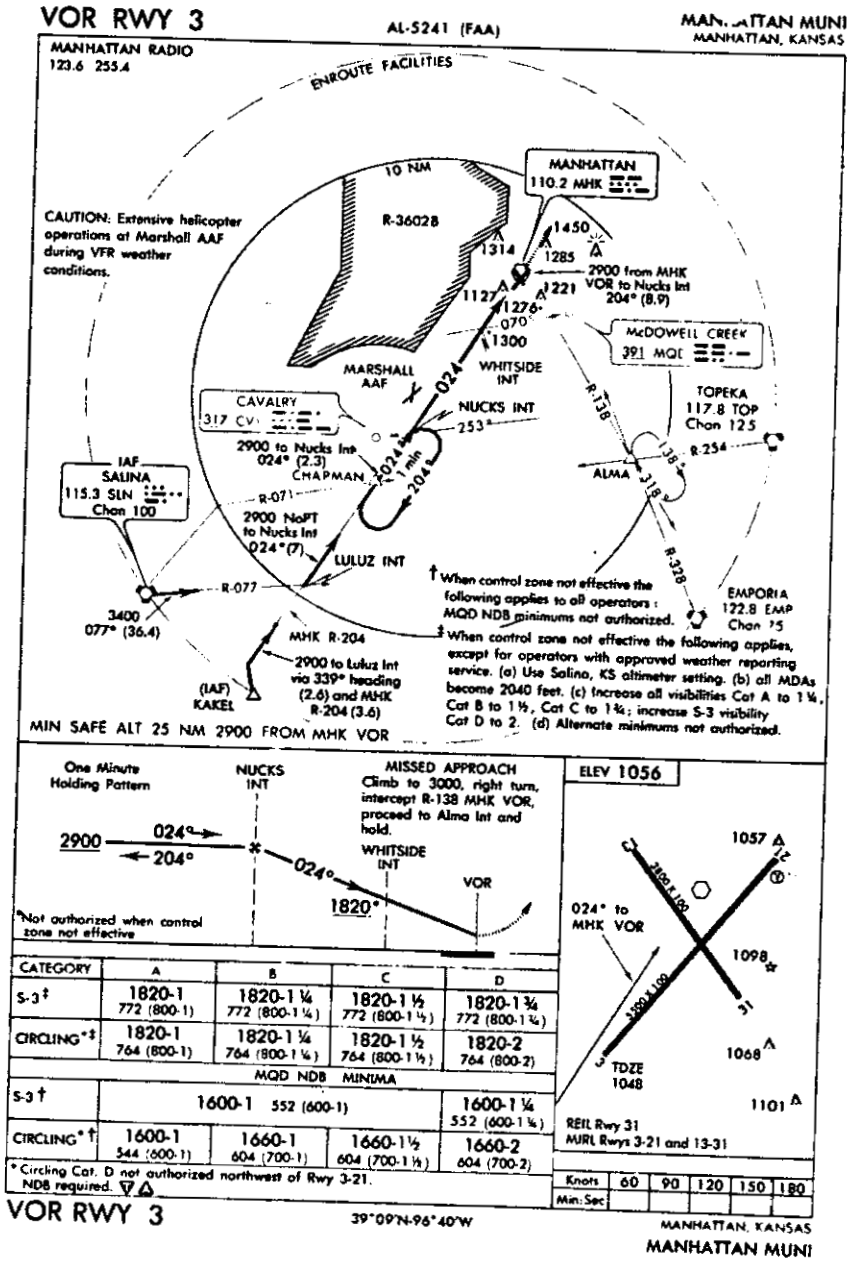

VOR RWY 3
AL-5241 (FAA)
MANHATTAN MUNI
MANHATTAN, KANSAS
MANHATTAN RADIO
123.6 255.4
ENROUTE FACILITIES
10 NM
MANHATTAN
110.2 MHK
R-3602B
CAUTION: Extensive helicopter operations at Marshall AAF during VFR weather conditions.
1450
1314
1285
2900 from MHK VOR to Nucks Int 204° (8.9)
1127
1221
1276
070
1300
McDOWELL CREEK
391 MQE
MARSHALL AAF
WHITSIDE INT
024
CAVALRY
317 CVI
NUCKS INT
253°
TOPEKA
117.8 TOP
Chan 125
R-138
R-254
2900 to Nucks Int 024° (2.3)
CHAPMAN
1 min
204
IAF
SALINA
115.3 SLN
Chan 100
R-071
ALMA
318
2900 NoPT to Nucks Int 024° (7)
LULUZ INT
R-077
R-328
EMPORIA
122.8 EMP
Chan 75
3400
077° (36.4)
MHK R-204
2900 to Luluz Int via 339° heading (2.6) and MHK R-204 (3.6)
(IAF)
KAKEL
† When control zone not effective the following applies to all operators: MQD NDB minimums not authorized.
‡ When control zone not effective the following applies, except for operators with approved weather reporting service. (a) Use Salina, KS altimeter setting. (b) all MDAs become 2040 feet. (c) Increase all visibilities Cat A to 1¼, Cat B to 1½, Cat C to 1¾; increase S-3 visibility Cat D to 2. (d) Alternate minimums not authorized.
MIN SAFE ALT 25 NM 2900 FROM MHK VOR
One Minute Holding Pattern
2900
024°
204°
NUCKS INT
MISSED APPROACH
Climb to 3000, right turn, intercept R-138 MHK VOR, proceed to Alma Int and hold.
024°
WHITSIDE INT
VOR
1820°
*Not authorized when control zone not effective
ELEV 1056
1057
024° to MHK VOR
3500 X 100
1098
3500 X 100
31
1068
TDZE
1048
1101
REIL Rwy 31
MIRL Rwys 3-21 and 13-31
CATEGORY | A | B | C | D
S-3‡ | 1820-1 772 (800-1) | 1820-1¼ 772 (800-1¼) | 1820-1½ 772 (800-1½) | 1820-1¾ 772 (800-1¾)
CIRCLING*‡ | 1820-1 764 (800-1) | 1820-1¼ 764 (800-1¼) | 1820-1½ 764 (800-1½) | 1820-2 764 (800-2)
MQD NDB MINIMA
S-3† | 1600-1 552 (600-1) | | | 1600-1¼ 552 (600-1¼)
CIRCLING*† | 1600-1 544 (600-1) | 1660-1 604 (700-1) | 1660-1½ 604 (700-1½) | 1660-2 604 (700-2)
* Circling Cat. D not authorized northwest of Rwy 3-21. NDB required. ▽△
Knots | 60 | 90 | 120 | 150 | 180
Min:Sec
VOR RWY 3
39°09'N-96°40'W
MANHATTAN, KANSAS
MANHATTAN MUNI

FIG. 26

372. Refer to Fig. 25. If the pilot elects to fly a magnetic heading of 130° from over TYRO Intersection, the approximate relative bearing to the NDB as the airplane crosses the final approach course will be

S16 1- 200°.
2- 210°.
3- 220°.
4- 240°.

373. Refer to Fig. 25. Suppose you are holding according to the missed approach instructions, and a relative bearing of 350° is required to maintain the 340° inbound course. What outbound heading should be flown?

S16 1- 140°.
2- 150°.
3- 160°.
4- 170°.

374. Refer to Fig. 25. Suppose you are holding according to the missed approach instructions, and a relative bearing of 345° is required to maintain the 340° inbound course. What outbound heading should be flown?

S16 1- 130°.
2- 145°.
3- 150°.
4- 155°.

375. Refer to Fig. 26. Suppose that upon arrival at Kakel Intersection, ATC instructs the pilot to proceed to LULUZ Intersection, and issues a clearance for the approach. The minimum altitude to which the pilot should descend prior to reaching LULUZ is

S16 1- 1,600 feet.
2- 1,820 feet.
3- 2,900 feet.
4- 3,400 feet.

376. Where a holding pattern is specified in lieu of a procedure turn, the holding maneuver must be executed within

S22 1- a maximum airspeed of 165 knots.
2- the 1 minute time limitation or published leg length.
3- a radius of 5 miles from the holding fix.
4- 10 knots of the specified holding speed.

377. Refer to Fig. 25. If the pilot elects to fly a magnetic heading of 120° from over TYRO Intersection, the approximate relative bearing to the NDB as the airplane crosses the final approach course will be

S16 1- 200°.
2- 210°.
3- 220°.
4- 240°.

378. Refer to Fig. 26. To complete the VOR RWY 3 approach at Manhattan the minimum navigational equipment would be

S16 1- one VOR receiver.
2- two VOR receivers.
3- one VOR and one ADF receiver.
4- two VOR and one ADF receivers.

379. Refer to Fig. 26. If the control zone is not effective, and approved weather reporting service is not available, the VOR RWY 3 straight-in MDA would be

S16 1- 1,600 feet.
2- 1,700 feet.
3- 1,820 feet.
4- 2,040 feet.

380. If the pilot loses visual reference while circling to land from an instrument approach and ATC radar service is not available, the missed approach action should be to

S24 1- climb to the published circling minimums then proceed direct to the final approach fix.
2- climb straight ahead to the initial approach altitude then proceed direct to the final approach fix.
3- make a climbing turn toward the landing runway and continue the turn until established on the missed approach course.
4- execute a climbing turn to parallel the published final approach course and climb to the inital approach altitude.

381. Refer to Fig. 26. The minimum navigational equipment needed to utilize the 1600 foot MDA at Manhattan is

S16 1- one VOR receiver.
2- two VOR receivers.
3- one VOR and one ADF receiver.
4- two VOR and one ADF receivers.

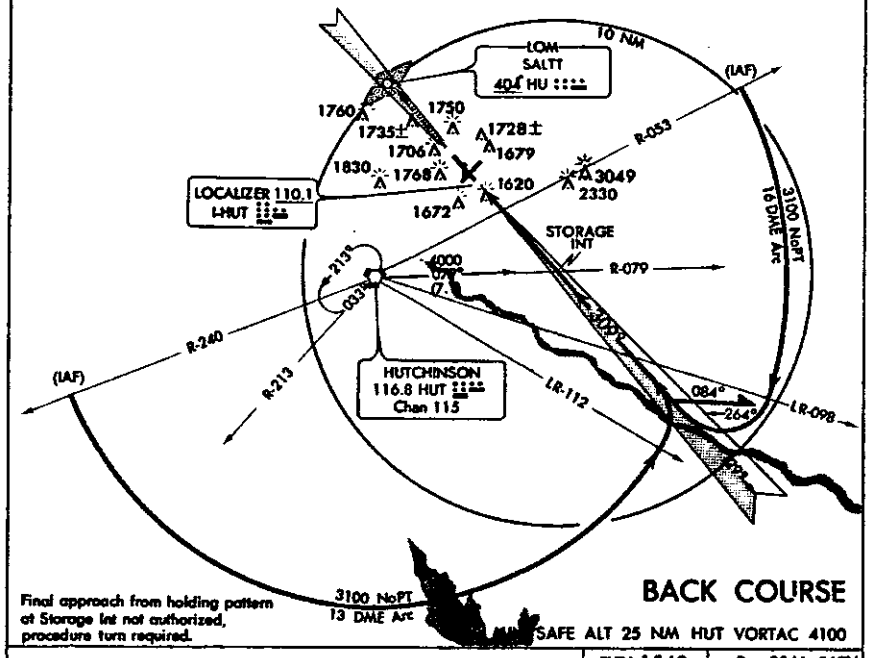
Amdt 9

# LOC BC RWY 31

AL-200 (FAA)

HUTCHINSON MUNI
HUTCHINSON, KANSAS

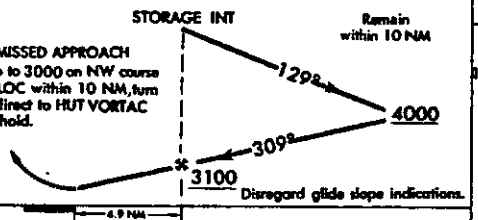
HUTCHINSON APP CON
125.5 325.8
HUTCHINSON TOWER*
118.5 363.0
GND CON
121.9




BACK COURSE

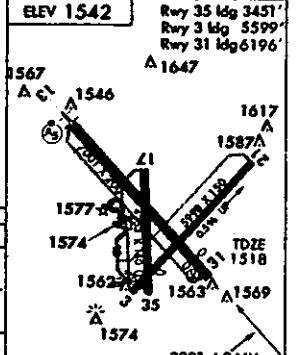
SAFE ALT 25 NM HUT VORTAC 4100

Final approach from holding pattern at Storage Int not authorized, procedure turn required.




| CATEGORY | A | B | C | D |
|---|---|---|---|---|
| S-31 | 1880-¾ 362 (400-¾) | | | 1880-1 362 (400-1) |
| CIRCLING | 2080-1 538 (600-1) | | 2080-1½ 538 (600-1½) | 2100-2 558 (600-2) |

When control zone not effective, the following applies: (1) For operators without approved weather reporting service: (a) Use Wichita, KS altimeter setting. (b) Increase S-31 MDAs to 2020 feet all Cats., increase visibility Cat. D to 1¼ miles. (c) Increase circling MDAs to 2220 feet all Cats.. (2) Alternate minimums not authorized.




| FAF to MAP 4.9 NM | | | | | |
|---|---|---|---|---|---|
| Knots | 60 | 90 | 120 | 150 | 180 |
| Min:Sec | 4:54 | 3:16 | 2:27 | 1:58 | 1:38 |

LOC BC RWY 31 38°04'N-97°52'W HUTCHINSON, KANSAS HUTCHINSON MUNI

FIG-27

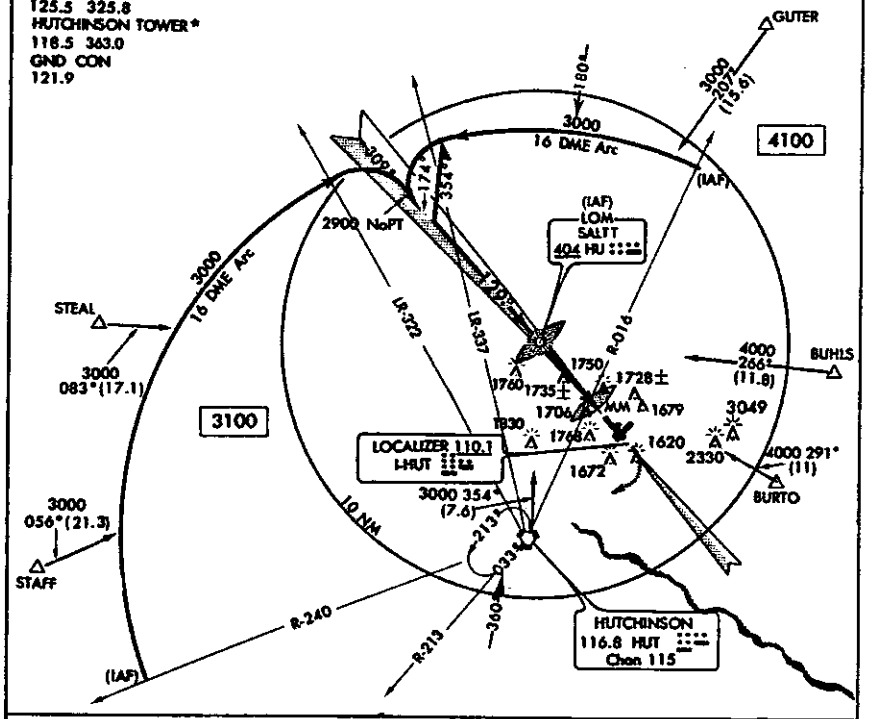
Amdt 9

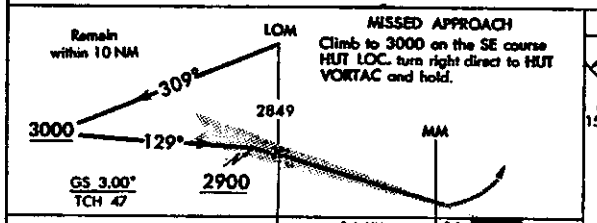
# ILS RWY 13

AL-200 (FAA)

HUTCHINSON MUNI
HUTCHINSON, KANSAS

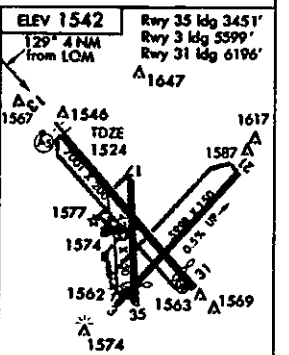
HUTCHINSON APP CON
125.5 325.8
HUTCHINSON TOWER*
118.5 363.0
GND CON
121.9




| CATEGORY | A | B | C | D |
|---|---|---|---|---|
| S-ILS 13 | 1724-½ 200 (200-½) | | | |
| S-LOC 13 | 2000-½ 476 (500-½) | | | 2000-¾ 476 (500-¾) |
| CIRCLING | 2080-1 538 (600-1) | | 2080-1½ 538 (600-1½) | 2100-2 558 (600-2) |

When control zone not effective the following applies: 1. To operators without approved weather reporting service: (a) Use Wichita, KS altimeter setting. (b) Increase S-LOC 13 MDAs to 2120 all Cats., increase visibility Cat. D to 1 mile. (c) Increase circling MDAs to 2220, all Cats. 2. To all operators: (a) Increase S-ILS 13 visibility to ¼ mile, all Cats. (b) Increase S-LOC 13 visibility Cat. A, B and C to ¼ mile. 3. Alternate minimums NA.




| FAF to MAP 4 NM | | | | | |
|---|---|---|---|---|---|
| Knots | 60 | 90 | 120 | 150 | 180 |
| Min:Sec | 4:00 | 2:40 | 2:00 | 1:36 | 1:20 |

ILS RWY 13 38°04'N-97°52'W HUTCHINSON, KANSAS HUTCHINSON MUNI

FIG-28

§ **HUTCHINSON MUNI** (HUT) 3.5 E GMT-6(-5DT) 38°03'56"N 97°51'37"W — WICHITA
1542 B S4 FUEL 100, JET A OX 1 CFR Index A — H-10, 3A, 2H, L-6G
RWY 13-31: H7001X200 (ASPH-CONC) S-42, D-52, DT-76 HIRL — IAP
RWY 13: MALSR Tree. RWY 31: VASI. Trees. Thld dsplcd 805'.
RWY 03-21: H5998X150 (ASPH-CONC) S-42, D-52, DT-76 MIRL
RWY 03: REIL. Road. Thld dsplcd 400'. RWY 21: Ground.
RWY 17-35: H4253X150 (ASPH) S-42, D-50, DT-76 MIRL
RWY 17: Trees. RWY 35: Road. Thld dsplcd 800'
AIRPORT REMARKS: Attended 1200-0400Z‡ O/T For svc ctc FBO Wells Acft. Call 663-1546. Request acft on VFR practice ILS approaches make procedure turn at 3200' MSL to avoid military VFR low level routes at 2600' MSL. For MALSR Rwy 13, after tower closed, key 118.5 7 times in 5 secs for hi intensity; 5 times in 5 secs for med; and 3 times in 5 secs for low. 15 min duration. Control Zone effective 1300-0500Z‡.
COMMUNICATIONS: UNICOM 123.0
WICHITA FSS (ICT) LC 663-5002 NOTAM FILE HUT
HUTCHINSON LRCO 122.1R 116.8T (WICHITA FSS)
APP CON 125.5 118.5 Opr 1300-0500Z‡
TOWER 118.5 Opr 1300-0500Z‡ O/T ctc WICHITA FSS on 118.5. GND CON 121.9
VFR Advisory Service on 125.5
RADIO AIDS TO NAVIGATION:
(L) VORTAC 116.8 HUT Chan 115 37°59'49"N 97°56'02"W 033° 5.0 NM to fld. 1530/9E
SALTT NDB (LOM) 404 HU 38°07'25"N 97°55'35"W 129° 4.0 NM to fld
ILS 110.1 I-HUT Rwy 13 LOM SALTT NDB
COMM/NAVAID REMARKS: No Scheduled Weather Broadcast.

382. Refer to Fig. 27, and the Airport/Facility Directory excerpt above. If the time is 0800 DT when passing Storage Intersection inbound, the MDA for the straight-in 31 approach would be

S17 1- 1,880 feet.
2- 2,020 feet.
3- 2,080 feet.
4- 3,100 feet.

383. Refer to Fig. 27, and the Airport/Facility Directory excerpt above. If the time is 0600 DT when passing Storage Intersection inbound, the MDA for the straight-in approach would be

S17 1- 1,880 feet.
2- 2,020 feet.
3- 2,080 feet.
4- 3,100 feet.

384. Refer to Fig. 28. What obstruction clearance criteria is provided by the published minimum sector altitude 4100 for the ILS RWY 13 approach to Hutchinson Municipal Airport?

S17 1- 1,000-foot clearance over all obstructions in that sector within 25 miles of the Saltt LOM.
2- 1,000-foot clearance over all obstructions in that sector within 25 miles of the Hutchinson VORTAC.
3- 2,500-foot clearance over all obstructions in that sector within 25 miles of the Hutchinson VORTAC.
4- 2,500-foot clearance over all obstructions in that sector within 25 miles of the Saltt LOM.

385. Refer to Fig. 27, and the Airport/Facility Directory excerpt above. If the time is 0800 DT when passing Storage Intersection inbound, the MDA while circling to land would be

S17 1- 1,880 feet.
2- 2,020 feet.
3- 2,080 feet.
4- 2,220 feet.

386. Refer to Fig. 27, and the Airport/Facility Directory excerpt above. If the time is 0600 DT when passing Storage Intersection inbound, the MDA while circling to land would be

S17 1- 1,880 feet.
2- 2,020 feet.
3- 2,080 feet.
4- 2,220 feet.

387. Refer to Fig. 28, and the ILS-RWY 13 approach chart for Hutchinson, Kansas. Suppose you pass the LOM inbound and the tower advises that the ceiling is 200 feet and the visibility is 1/4 mile. Under these circumstances you are

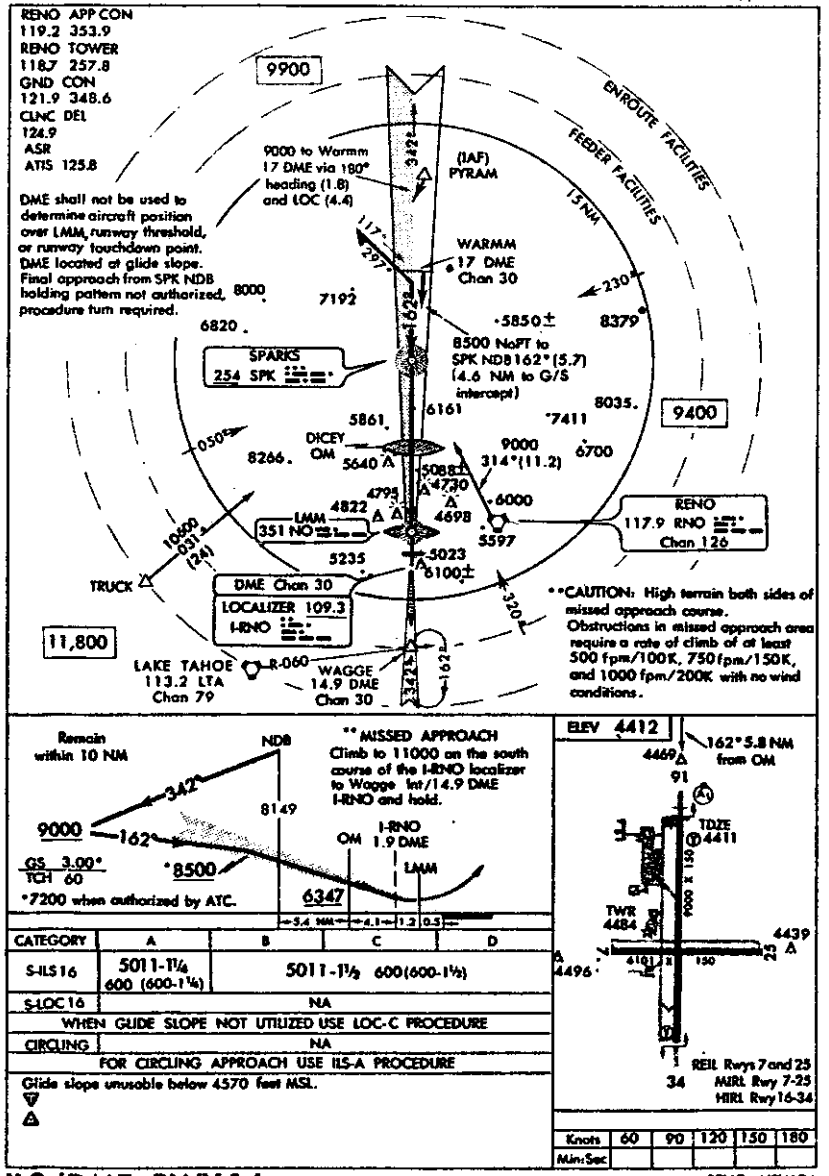
S17 1- required to execute a missed approach and proceed directly to the alternate.
2- required to execute a missed approach immediately upon receipt of the weather information.
3- allowed to continue the approach to 50 feet below the published DH before executing a missed approach.
4- allowed to continue the approach below the published DH if the environment of the approach end of the runway is in sight, but you must not land unless the visibility is at least 1/2 mile.

Amdt 1

# ILS/DME RWY 16

AL-346 (FAA)

CANNON INTERNATIONAL
RENO, NEVADA







| CATEGORY | A | B | C | D |
|---|---|---|---|---|
| S-ILS 16 | 5011-1¼ 600 (600-1¼) | 5011-1½ 600 (600-1½) | | |
| S-LOC 16 | NA | | | |
| | WHEN GLIDE SLOPE NOT UTILIZED USE LOC-C PROCEDURE | | | |
| CIRCLING | NA | | | |
| | FOR CIRCLING APPROACH USE ILS-A PROCEDURE | | | |

Glide slope unusable below 4570 feet MSL.




| Knots | 60 | 90 | 120 | 150 | 180 |
|---|---|---|---|---|---|
| Min:Sec | | | | | |

ILS/DME RWY 16

39°30'N – 119°46'W

RENO, NEVADA
CANNON INTERNATIONAL

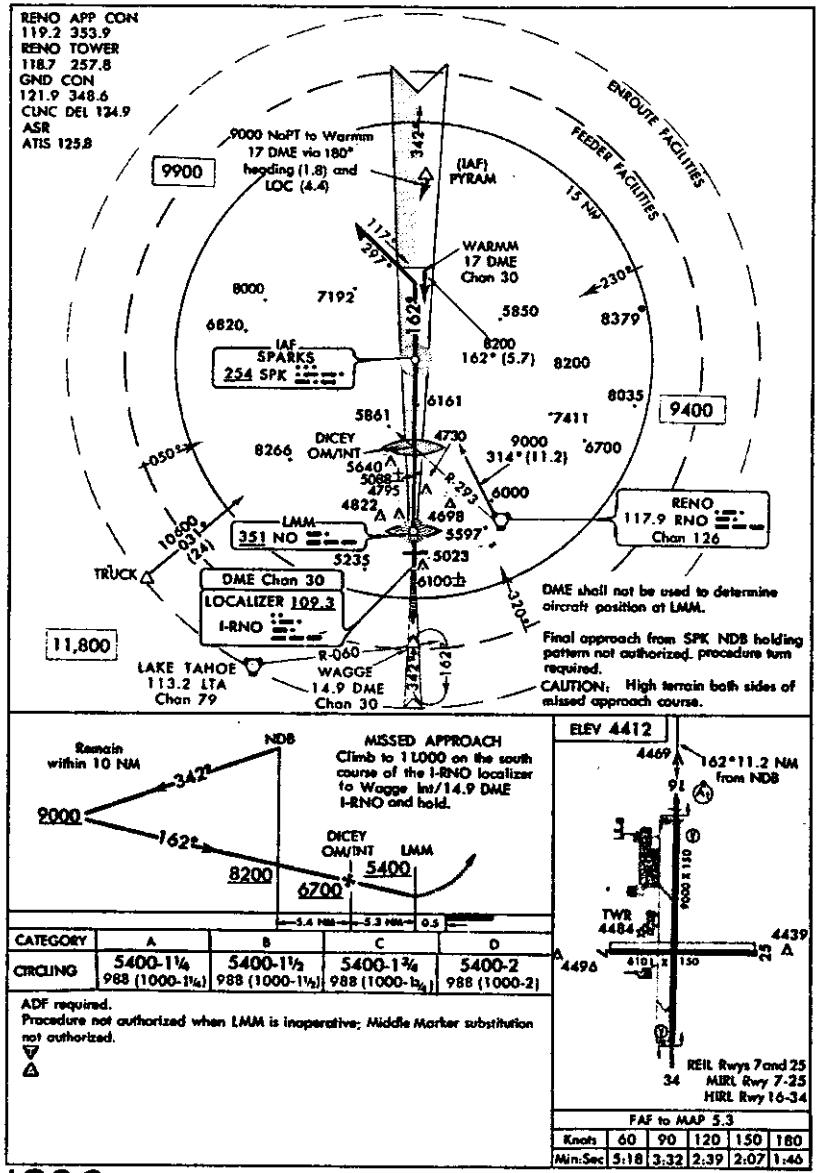
FIG-29

Amdt 2

# LOC-C

AL-346 (FAA)

CANNON INTERNATIONAL
RENO, NEVADA







| CATEGORY | A | B | C | D |
|---|---|---|---|---|
| CIRCLING | 5400-1¼ 988 (1000-1¼) | 5400-1½ 988 (1000-1½) | 5400-1¾ 988 (1000-1¾) | 5400-2 988 (1000-2) |

ADF required.
Procedure not authorized when LMM is inoperative; Middle Marker substitution not authorized.



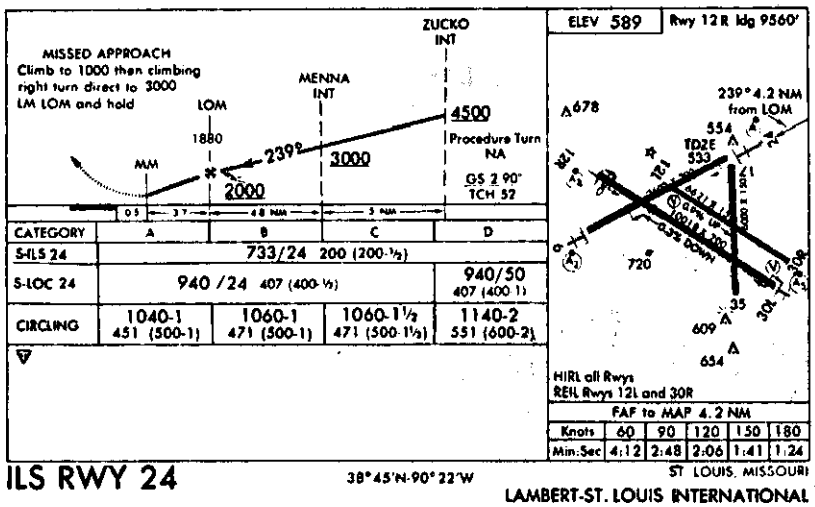

| FAF to MAP 5.3 | | | | | |
|---|---|---|---|---|---|
| Knots | 60 | 90 | 120 | 150 | 180 |
| Min:Sec | 5:18 | 3:32 | 2:39 | 2:07 | 1:46 |

LOC-C

39°30'N – 119°46'W

RENO, NEVADA
CANNON INTERNATIONAL

FIG-30




**ILS RWY 24** 38°45'N-90°22'W ST LOUIS, MISSOURI

LAMBERT-ST. LOUIS INTERNATIONAL

388. Refer to Fig. 29 and Fig. 30. If while making an LOC approach to Cannon Int'l. and the glide slope is not utilized the MDA would be

S17 1- 600 feet.
2- 988 feet.
3- 5,011 feet.
4- 5,400 feet.

389. Refer to Fig. 29. Which of the following statements is correct concerning the ILS/DME RWY 16 approach procedure?

S17 1- DME shall not be used to establish the middle marker.
2- Wagge Intersection is located 14.9 DME from the Lake Tahoe VORTAC.
3- The initial approach fix at PYRAM is located 17 DME from Reno VORTAC.
4- The DME transmitter is colocated with the compass locator at the middle marker.

390. According to the chart segment above, what is the height of the circling MDA above the airport (HAA) for category A aircraft?

S17 1- 200 feet.
2- 408 feet.
3- 451 feet.
4- 471 feet.

391. Refer to Fig. 30. The final approach fix for the LOC-C approach procedure is located at the

S17 1- SPARKS NDB.
2- DICEY OM Intersection.
3- WARMM Intersection.
4- LMM 0.5 DME from the runway threshold.

392. Refer to Fig. 29. Unless authorized by ATC, the minimum altitude to which a pilot should descend at SPARKS inbound is

S17 1- 6,347 feet.
2- 8,149 feet.
3- 8,500 feet.
4- 9,000 feet.

393. According to the chart segment above, the minimum altitude to which the pilot should descend until past the FAF, is

S17 1- 1,880 feet.
2- 2,000 feet.
3- 3,000 feet.
4- 4,500 feet.

394. According to the chart segment above, what is the touchdown elevation on a straight-in ILS approach to RWY 24?

S17 1- 200 feet.
2- 533 feet.
3- 554 feet.
4- 610 feet.

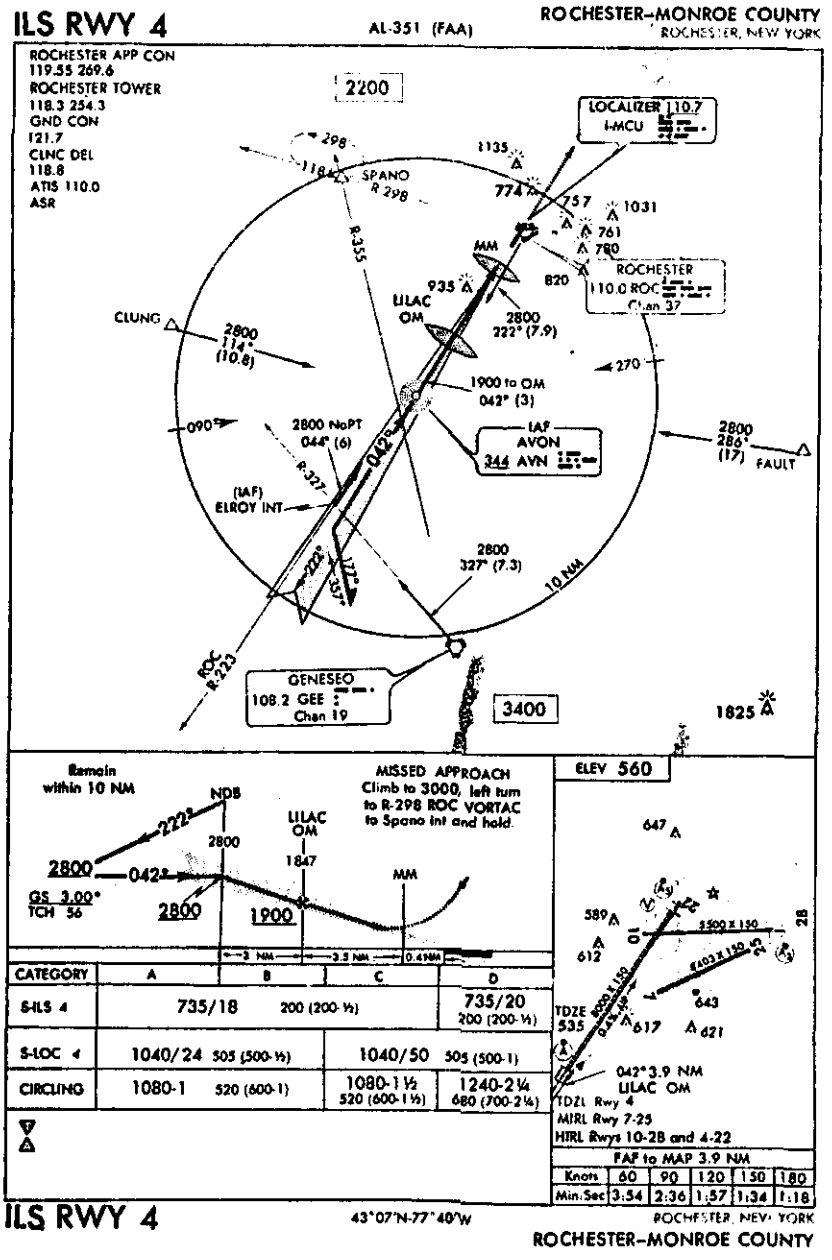
395. According to the chart segment above, what is the height of the DH above the touchdown zone (HAT)?

S17 1- 200 feet.
2- 400 feet.
3- 451 feet.
4- 500 feet.

396. According to the chart segment above, what length landing surface is available for landing on RWY 12R?

S17 1- 4,000 feet.
2- 7,600 feet.
3- 8,621 feet.
4- 9,560 feet.

FIG. 31

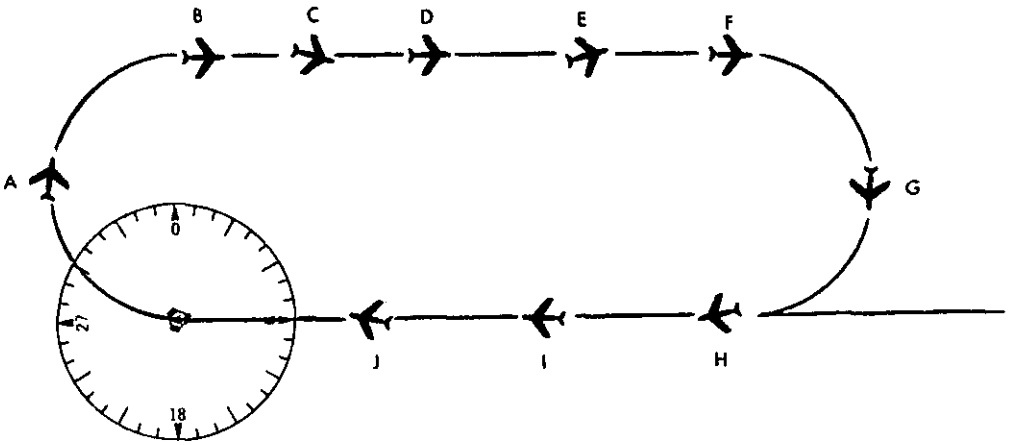



397. Refer to Fig. 31. Which of the following is correct concerning the missed approach for the ILS RWY 4 procedure?

S17 1- Turn left, proceed direct to Spano and hold at 3,000 feet.
2- Turn left, intercept R-298 ROC VORTAC, then climb to 3,000 feet and hold at Spano.
3- Climb straight ahead to 3,000 feet and proceed direct to Spano Intersection and hold.
4- Climb straight ahead to 3,000 feet, then turn left to intercept R-298 ROC VORTAC, then to Spano Intersection and hold.

398. Refer to Fig. 31. At what point should the missed approach be initiated on the S-LOC-4 approach to RWY 4 at Rochester Monroe County Airport?

S17 1- After passing the VOR station located on the field.
2- After arriving at 1,040 feet, if the runway is not in sight.
3- When the specified time has expired after passing Avon RBn.
4- When the specified time has expired after passing the outer marker.




399. Refer to Fig. 31. What is the straight-in DH and landing minimums for other than a category D airplane at Rochester-Monroe County Airport?

S17 1- 505 feet and 2400 RVR.
2- 735 feet and 1800 RVR.
3- 1,040 feet and 2400 RVR.
4- 1,080 feet and 1 mile.

400. Refer to Fig. 31. What is the minimum altitude for holding after completing a missed approach from the ILS RWY 4 approach at Rochester-Monroe County Airport?

S17 1- 2,100 feet.
2- 2,200 feet.
3- 3,000 feet.
4- 3,300 feet.

401. Assume this clearance is received.

"CLEARED FOR ILS RUNWAY 07 LEFT APPROACH, SIDE-STEP TO RUNWAY 07 RIGHT."

When would the pilot be expected to commence the side-step maneuver?

S17 1- After reaching the circling minimums for Runway 07 right.
2- Any time after ATC advises that the pilot has passed the side-step fix.
3- As soon as possible after the runway environment is in sight.
4- Any time after becoming aligned with the final approach course of Runway 07 left, and after passing the final approach fix.

402. Refer to the holding pattern above. A 20° drift correction to the right is necessary to maintain the 090 radial inbound. What is the recommended procedure for drift correction during the remainder of the pattern?

S22 1- More than a standard rate turn at A; 20° left correction from B to F; less than standard rate turn at G.
2- A standard rate turn at A; more than 20° left correction from B to F; a standard rate turn at G.
3- A standard rate turn at A; 20° left correction from B to F; a standard rate turn at G.
4- Less than a standard rate turn at A; more than a 20° left correction from B to F; more than a standard rate of turn at G.

403. Refer to the holding pattern above. A 20° drift correction to the left is necessary to maintain the 090 radial inbound. What is the recommended procedure for drift correction during the remainder of the pattern?

S22 1- A standard rate turn at A; 20° left correction from B to F; a standard rate turn at G.
2- A standard rate turn at A; more than a 20° right correction from B to F; a standard rate turn at G.
3- Less than a standard rate turn at A; less than a 20° right correction from B to F; a standard rate turn at G.
4- More than a standard rate turn at A; more than 20° right correction from B to F; less than a standard rate turn at G.

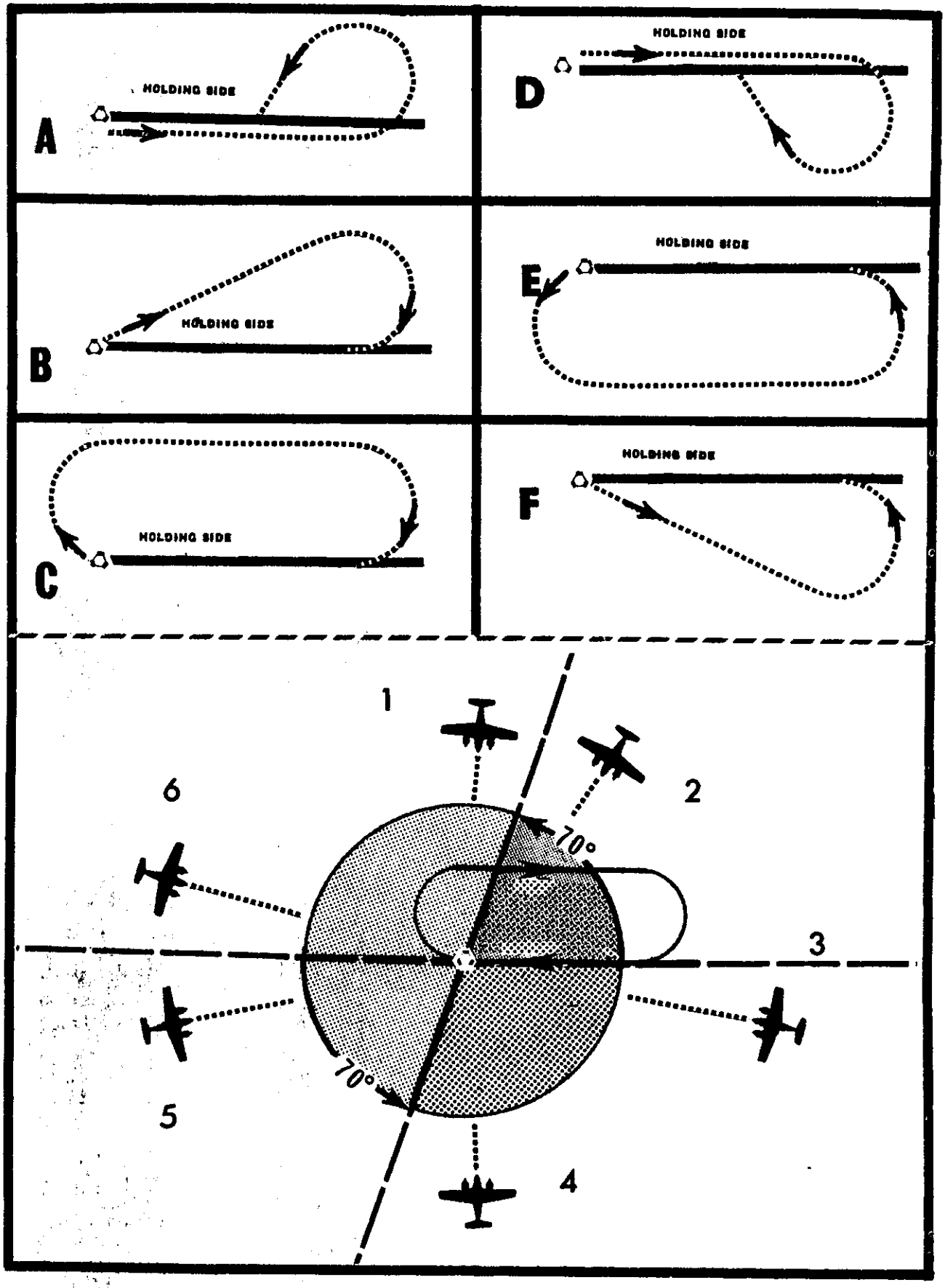

A
HOLDING SIDE
B
HOLDING SIDE
C
HOLDING SIDE
D
HOLDING SIDE
E
HOLDING SIDE
F
HOLDING SIDE
1
2
3
4
5
6
70°
70°

FIG.32

404. Refer to the upper and lower portion of Fig. 32. Based on the aircraft heading shown for airplane 1, the depicted holding pattern should be entered by using which entry procedure shown?

S22 1- A.
2- B.
3- D.
4- F.

405. Refer to the upper and lower portion of Fig. 32. Based on the aircraft heading shown for airplane 2, the depicted holding pattern should be entered by using which entry procedure shown?

S22 1- A.
2- B.
3- C.
4- D.

406. Refer to the upper and lower portion of Fig. 32. Based on the aircraft heading shown for airplane 3, the depicted holding pattern should be entered by using which entry procedure shown?

S22 1- A.
2- B.
3- C.
4- D.

407. Refer to the upper and lower portion of Fig. 32. Based on the aircraft heading shown for airplane 5, the depicted holding pattern should be entered by using which entry procedure?

S22 1- A.
2- B.
3- C.
4- F.

408. Refer to the upper and lower portion of Fig. 32. Based on the aircraft heading shown for airplane 6, the depicted holding pattern should be entered by using which entry procedure?

S22 1- A.
2- B.
3- D.
4- F.

409. Refer to the upper and lower portion of Fig. 32. Based on the aircraft heading shown for airplane 4, the depicted holding pattern should be entered by using which entry procedure?

S22 1- B.
2- C.
3- D.
4- E.

410. If a missed approach is executed (prior to reaching the missed approach point) the pilot should, unless otherwise directed by ATC,

S24 1- execute a climbing turn and proceed direct to the initial approach fix.
2- execute a climbing turn and proceed direct to the final approach fix.
3- climb straight ahead to the initial approach altitude then proceed direct to the initial approach fix.
4- continue the approach to the MAP at or above the MDA or DH before executing a turning maneuver.

411. Refer to the upper portion of Fig. 32. Which of the depicted entries properly illustrates a standard parallel entry procedure?

S22 1- A.
2- C.
3- D.
4- F.

412. Refer to the upper portion of Fig. 32. Which of the depicted entries properly illustrates a standard direct entry procedure?

S22 1- B.
2- C.
3- D.
4- E.

413. During recoveries from unusual attitudes, level flight is attained the instant

S10 1- a zero rate of climb is indicated on the vertical speed indicator.
2- straight-and-level flight is indicated by the turn coordinator.
3- the horizon bar on the attitude indicator is exactly overlapped with the miniature airplane.
4- the altimeter and airspeed needles stop prior to reversing their direction of movement.

414. To enter a constant-airspeed descent from level-cruising flight, and maintain cruising airspeed, the pilot should

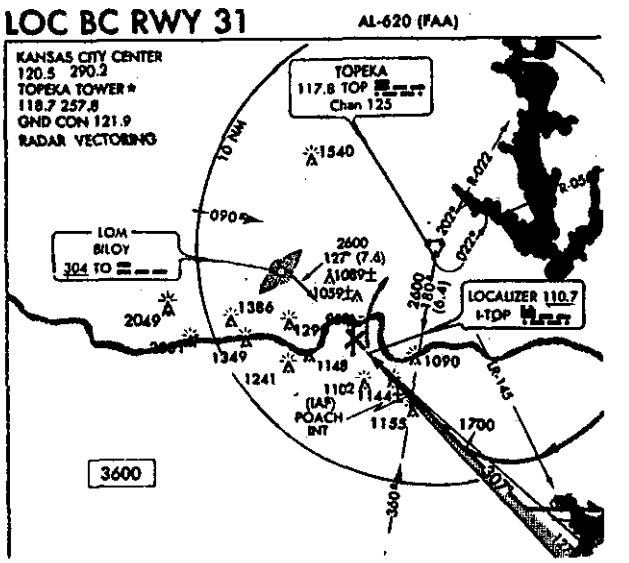
S06 1- simultaneously reduce power and adjust the pitch using the attitude indicator as a reference to maintain the cruising airspeed.
2- first adjust the pitch using the attitude indicator to establish a specific rate on the vertical speed indicator, then reduce the power to maintain the cruising airspeed.
3- first adjust the pitch attitude to a descent using the attitude indicator as a reference, then adjust the power to maintain the cruising airspeed.
4- first reduce power, then adjust the pitch using the attitude indicator as a reference to establish a specific rate on the vertical speed indicator.

415. In the Northern Hemisphere, which of the following would be correct about starting the rollout from a turn using a magnetic compass?

S07 1- Start the rollout before the compass indication reaches south by approximately 30° plus the pilot's normal lead.
2- Start the rollout before the compass indication reaches south by a number of degrees approximately equal to the latitude over which the turn is made plus the pilot's normal lead.
3- Start the rollout before the compass indication reaches south by a number of degrees approximately equal to the magnetic variation of the area over which the turn is made plus the pilot's normal lead.
4- Start the rollout after the compass indication passes south by a number of degrees approximately equal to the latitude minus the normal rollout lead.

416. When the approach procedure involves a procedure turn, the maximum speed should not be greater than

S26 1- 165 knots IAS.
2- 180 knots IAS.
3- 200 knots IAS.
4- 250 knots IAS.




417. Refer to the chart excerpt above. Which statement is correct concerning the term "Radar Vectoring" appearing at the upper left of the LOC BC RWY 31?

S21 1- Radar vectoring, ASR, and Par approaches are available.
2- Radar vectoring and ASR approaches are available.
3- Radar vectoring is available, but ASR and PAR approaches are not available.
4- All aircraft must be radar vectored to the final approach fix inbound.

418. What standard minimums are required to list an airport as an alternate on an IFR flight plan if the airport has a VOR approach only?

S11 1- 600 feet and 2 miles.
2- 800 feet and 1 mile.
3- 800 feet and 2 miles.
4- 1,000 feet and 3 miles.

419. For maintaining level flight at constant thrust, which instrument would be the least appropriate for determining the need for a pitch change?

R01 1- Altimeter.
2- Attitude indicator.
3- Airspeed indicator.
4- Vertical speed indicator.